UNIVERSITÀ DEGLI STUDI DI SASSARI

SCUOLA DI DOTTORATO DI RICERCA
Scienze e Biotecnologie
dei Sistemi Agrari e Forestali
e delle Produzioni Alimentari

Indirizzo Monitoraggio e Controllo degli Ecosistemi Forestali in ambiente mediterraneo

Ciclo XXVI

Discovering and resolving value, goat breeders' local knowledge in Sardinia

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Anno accademico 2012- 2013

ABSTRACT

With my dissertation I provide evidence that qualitative research methods with photo-elicitation tools is a meaningful method in working to restore local knowledge for the conservation of agro-forestry ecosystems in Sardinia. With interviews and observations I interact with three goat breeders in Nuoro province, for the purpose of recovering local knowledge and to understand the complexity of eco-system conservation. Goat breeders have been chosen, because they interact-with and depend -on forests. They have first-hand experience in adapting their daily practices to surviving in complex ecosystems. The value of photography as a tool for eliciting farmer knowledge is not yet recognized as intellectual pursuit nor in forestry nor in animal husbandry sciences. In my opinion the concept of modernity which is based on the reductionist and mechanistic science, has induced mankind to study and manage the resources for individual and independent advantages and needs. In order for agriculture to be sustainable, in my country or in Sardinia, I must have these skills, so I can include local farmer knowledge in the important decisions I make as an educator of students, faculty, and farmers.

Key words: Goat breeders, Local knowledge, Interview, Qualitative research, Photo-elicitation

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TABLE OF CONTENTS

When an elder dies, a library burns

Abdullah Halim
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1 INTRODUCTION

1.1. My story

My interest in this research comes from personal experiences and the study in the Animal Science Department, Faculty of Agriculture, University of Herat-Afghanistan where I graduated with a BS degree in 1994.

During this period I studied different courses in Animal husbandry. I gained knowledge about the importance of animal orders and in particular the ruminants and their importance in human life. I learned how ruminants change the low quality forage crops, weeds and residues of cultivated plants into important food (meat, milk, cheese, yogurt.....). After graduation, I started working in this department as an assistant professor and lecturer. I taught different courses in the Faculty of Agriculture, such as Animal Feeding, Milk Production and Technology, Dairy and Beef Cattle Production, Sheep and Goat Production, Wool and Karakul (Karakul is sheep's hide used in the manufacturing of hats, coats and overcoats).

In addition, I would like to gather further information about ruminant management, ruminant influence on the environment, ruminant interaction with pasture lands and forests. I observed and took into consideration the practical information on animal husbandry and its role in the local ecological method learning how breeders apply their knowledge to rear their herds.

I worked for the Dutch Committee for Afghanistan (DCA) as an Extension and Monitoring Agent for two years. I was in charge of several missions in different parts of Western Region of Afghanistan. During the practical work with the Afghan rural society, I observed how breeders rear their herds and interact with the land and the environment. I witnessed

their methods of fodder crop making, their use of pasture at different seasons, the kind of water and medicines used, the way they milk their herds, how they process the milk, and their selling pattern. I also studied the Afghan community and (related to) the breeders and breeding problems. They were also facing many problems in their lives and in their activities.

Of course, the issue has many different dimensions, four specific perspectives will be considered more in detail: Human activity, Natural events, Land use, Poverty.

1.1.1. Human activity

Human activities can be classified as activities occurring in natural environments by human interventions. They can have positive or negative impacts and effects on our lives. The positive impacts are the development of agriculture, industry and urbanization, food production, buildings of shelters and economical benefits. The negative impacts contribute to war and the destruction of sound environments.

The natural resources are highly dependent on human activities and capacities. Human activities have caused several problems in both agriculture and livestock sectors in Afghanistan.

The majority of the villagers in Afghanistan are dependent on agriculture and livestock. (Qureshi and Akhtar, 2004).

Security problems

Afghanistan and the Afghan people have been facing the war for the past three decades since the Russian military attack in Afghanistan in 1978. It has continued with the civil wars between various groups of Mujahedeen and between the Mujahedeen and the Taliban since 2001 up until the International Military arrived in Afghanistan. So during these three

decades, the war devastated all of the infrastructures in Afghanistan (ethics, economy and agricultural).

According to the Health Sector Contingency Plan Report for drought 2011- 2012 , Afghanistan has been in a situation of protracted crisis underlined by an on-going conflict, re-occurring natural disasters (ranging from small, medium to large scaled), weak governance systems, scarce resources and underdeveloped livelihood for more than 30 years.

War has paid a heavy toll on Afghanistan's economy and increased vulnerability and hardship for many (predominantly rural) communities. There has been widespread damage to productive potential of land and extinction of livestock (Qureshi and Akhtar, 2004).

During the war, nobody could live in a normal situation, so the majority of farmers were forced to leave their homes and farms. They lost their land and herds. More than five million people have been displaced as refugees to cities and to neighboring countries. This has caused social changes in the Afghan society. The scientific experiences and cultural knowledge are being progressively lost and the community is experiencing dramatic social and economical problems.

Rain-fed Agriculture

Shrub land, savannah and grassland comprise a fragile natural environment that has been subjected to pressure for thousands of years, by local people and their livestock. Some parts of these areas suitable for plowing with tractor in the Western Region of Afghanistan, have been converted to rain-fed wheat production and cumin production. This kind of activity doesn't mean perennial work because lands don't have the capacity to produce for more than three or four years, after which the lands degrade because of wind erosion and water erosion. Forests and woodlands, throughout Afghanistan are being cut down for construction, wood fuel and the trade with the neighboring countries, without any consideration of their ecological and environmental value.

Urbanization

Another effect of war is the urban sprawl. During these decades, the population has increased and the less productive farmers have moved to the cities. Due to this, the agricultural land is being used for construction purposes, increasing urban extension as for example the building of schools, roads and factories.

1.1.2 Natural effects (Natural disasters)

Natural disasters are extreme, sudden events caused by environmental factors that injure people and damage property. Earthquakes, windstorms, floods, drought and disease all strike anywhere on earth, often without warning (world news). Afghanistan faced this kind of disasters during last decades.

Drought Years

The South Asian regions have been among the perennially drought-prone regions of the world. Afghanistan, India, Pakistan and Sri Lanka have reported droughts at least once in three years in the past five decades (Ray et al., 2008). Drought is often defined in climatic terms as a continuous interval of time during which the actual moisture supply at a given place is consistently less than normally expected. Drought has been grouped as meteorological, hydrological, agricultural, and socioeconomic (Ray et al., 2008).

Since the mid-1990s, prolonged and widespread droughts have occurred in consecutive years in Afghanistan, India and Pakistan, Sri Lanka, Nepal and Bangladesh (Ray et al., 2008). Drought had meteorological, hydrological, agricultural, and socioeconomic affects in Afghanistan. The impact of droughts was more severe on the food, water, health, immigration and agricultural sector (in rain-fed areas). Preliminary estimates of FAO suggest that about half of the population was directly or indirectly affected by drought. (Qureshi and Akhtar, 2004)

- In agriculture sector and rain fed area: FAO specifies the following effects of drought: crop loss, lower yields from crops, forest and range fires, land degradation and soil erosion (Hall, 2012).
- In livestock sector: the loss of livestock, farmers have lost access to pastures, and there have been massive losses in the fodder crops, this has had a crippling effect on livestock health, price and livestock deaths. Also drought created damage to fish habitat.
- Livelihood: the loss of livelihood and its effect on the agrarian economy, increased acute food insecurity and malnutrition. It also quadrupled the food market prices and livestock was sold at almost one quarter of its original price. The agricultural day laborers and the rain-fed agriculture society suffered a lack of on-farm work. Hundreds of thousands of families have lost their primary source of income.
- Water: reduced access to potable water, agricultural water resources destroyed. Most of the traditional groundwater irrigation systems, experienced reduced discharge or completely dried up.
- Health effects: infestation of insects, plant and animal diseases and high livestock mortality.
- Immigration: Around 300,000 people fled to neighboring Iran and Pakistan and more than 400,000 moved to safe places within the country. (Qureshi and Akhtar, 2004)

1.1.3 Soil erosion and wind erosion

During the last three decades, pasture and shrub lands have been converted to rain-fed wheat and cumin production and this has created problems such as:

A. Pasture and range-land converted to rain-fed lands have low productivity and will produce for only 3 or 4 years. After this time span, the plowed lands remain vulnerable to soil erosion, wind and rain erosion due to loss of protective vegetation.

B. The production of rain-fed wheat and barley was reduced significantly, about 40% lower than in average years due to the lack of rainfall in springtime. This caused an acute shortage of seeds for wheat and other crops because most of the wheat and barley was consumed for food supply and nothing was left as a seed for the next crop (Qureshi and Akhtar, 2004).

During the decades, the irrigation systems have been destroyed by the negative consequences of war and drought resulting in land being abandoned. More than 15% of Afghanistan's irrigated land gets water from traditional underground systems such as Karezes (Qanats), Springs and shallow wells (locally called as Arhads). This system depends completely on the amount of rainfall during the year. Because of prolonged multi-year drought, about 60-70% karezes stopped functioning and 85% of the shallow wells were dried up (Qureshi, and Akhtar, 2004). Irrigated cultivation has decreased by 15–70%.

C. War and drought destructive years effected to replacing numerical people/farmers from owns lands, as human activity and conflict to environment is a key factor for sustaining lands and keep care to natural resources, the lands which left without people effective intervention, faced to natural effects and become degraded. Vast areas faced to wind and water erosion. Drought combined with overgrazing and conversion are increasing soil erosion, watershed degradation, reducing ecosystem services and biodiversity loss, threatening livelihood sources and leading to increased impoverishment of the Afghan people.

The Afghan economy was reeling from protracted conflict and severe drought, with cereal grain production down by half, livestock herds decimated, many fruit trees (Almond,

Walnut, Pistachio Khinjuk, Khinjuk Ground mulberry, Mulberry, Black Mulberry, Pine edible nut, Date Palm, Russian olive), orchards (Apple, Pomegranate, Apricot, Peach, Plum, Pear, Quince, Cherry, Orange, Lemon, Fig, Loquat, Banana, Mango) and vineyards (variety of Grapes) destroyed about 75–100% by war and drought. For example in cereals like wheat and barley the reductions were around 50–70%.

While the number of cows has decreased by 20–50% the number of goats and sheep has decreased by 40–65%. Farmers stated that birth rates of animals have also gone down. The degradation of the pasture-lands has resulted in a significant decrease in the available forage for the livestock of the kuchi (pastoral nomads) and the number of their animals has decreased significantly as compared to the number in normal rainfall years (Bhattacharyya et al., 2004).

1.1.4 Land Use

Land use involves the management and modification of environment for given purposes like agriculture, industry, urbanization and other.

The majority of the villagers in Afghanistan are dependent on agriculture and livestock. Breeders are moving their herds to natural pasture and range-lands. During food shortages and during the summer seasons a large number of animals are moved to pasture not carrying the capacity for grazing. This factor increases grazing pressure on natural pastures thus the land is faced with over grazing.

According to the FAO Surveying of Lands and Population in 1970, it was estimated that deciduous and evergreen forests of Afghanistan covered 5% of the total area. Today according to (Halle, 2009) report “most of the original forests have disappeared and woodland areas cover is about 2% of total land of Afghanistan”. Many factors contributing to the depletion of forest land in Afghanistan can be attributed to overgrazing, which prevents pasture, range and forest regeneration and increases vulnerability. Other problems

include the heavy use of forest resources for firewood, construction building material used for houses, farms, and schools, and illegal logging for export. There is continued poor management of natural resources due to lack of incentives for rehabilitation and more over weak community awareness and involvement.

The devastation of the infrastructures' role and the migration to the cities centers is a new phenomenon due to war that has created urban encroachments on pasture woodland and forest land.

1.1.5. Poverty

While I was teaching at Herat University in the Faculty of Agriculture, I translated, from English into Persian, the second and third sections of a book titled "Livestock Production and Range Management In Arid and Semiarid Areas" (Ahmad, 2005). In order to reduce poverty, the author of the second section of this book suggested, "small scale livestock farming (SSLF) such as poultry, small ruminants, backyard animals (highly productive, low stress animals you can raise at home), fish farms and beekeeping". As "(SSLF) goes beyond the financial balance of the farm (as difference between income and outcome) it entails a strong need for a sustainable use of the environment, as a key-skill necessary for survival".

SSLF is more effective to improve livelihoods and quality of life of poor rural households. An increase in direct income at a local level eventually encourages investments, and therefore contributes to vitalize the economies of rural areas. SSLF is also very important because of its positive and sustainable effects on the environment. Countless adaptation strategies have been refined by livestock keepers. all over the world. They guarantee conservation of biodiversity and its constant increase, preserving and cross-breeding local breeds for the best adaptation to any sort of local condition (including climate, diseases, parasites).

Unlike intensive production systems, small-scale farmers are able to cope with environmental constraints while at the same time they are capable of using and protecting the natural resources. Mixed farming for example, uses manure as a fertilizer to grow fodder to feed the livestock, and faces the substantial challenge of recycling waste in ways that do not add to water pollution (Steinfeld et al., 2006)."

In the third section titled "Range-land management", Ahmad (2005) focused on the classification of plants according to taste and an introduction on different planting systems: replanting and planting new adaptive shrubs and trees.

This has given me the understanding and knowledge on range-land (pasture and woodland) management of livestock production, rehabilitation of land and natural resources. Nevertheless these studies have proved to be insufficient as the Afghanistan agro forestry problems are too vast as I have mentioned above.

1.2. Research curiosity/question

The opportunity to improve my knowledge on livestock production management was provided to me in 2010, when University of Sassari with collaboration of University of Herat gave me the scholarship. Therefore I decided to join the forest section, of the department of Agriculture.

It was a pleasure for me to enter the PhD course in the academic year 2010/2011 (XXVI cycle), though coming from animal science background, the selection of a research path meaningful in a forestry environment was not evident. Goat breeding came into evidence as an interesting study field intersecting the two domains, due to the many interactions it implies.

In the following debate I have tried to find answers to these queries: how can goats survive in different climates? Which interaction do goats have with the forest? How can this knowledge be used with regards to the Afghanistan landscape?

Since goat domestication documented about 10,000 years ago (Zeder and Hesse, 2000), response mechanisms to environmental challenges have been evolving in livestock population, firstly in wild ancestor species and, since the Neolithic, in derived domesticate (Marsan et al, 2012). The main factors affecting livestock production are genetic potential, nutrition (Glasser et al, 2012), health and marketing (Ahmad, 2005).

Some 180 different breeds of goat have evolved (Porter, 1996). Many of these breeds developed more through genetic isolation and natural selection rather than through deliberate intervention by man (Devendra and Burns, 1983). Nevertheless, human selection has encouraged specific attributes and some breeds have become specialized. For example, Saanen, Alpine and Sarda goats are bred for milk, the Boer goat is bred exclusively for meat, and the Angora and Cashmere goat are bred for fiber (Glasser, et al., 2012).

The breeds used need also to be taken into consideration for the different types of landscapes. The understanding of genetic mechanisms of livestock adaptation to environment challenges is becoming an important topic at this time of rapid climate change. Local breeds adapted to a sustainable production in extreme and harsh environments will play a fundamental role in this process (Marsan et al., 2012).

There are significant differences amongst goat breeds in grazing behavior attributes, such as dietary preferences and propensity to consume specific plant species. Furthermore, herds that are used for different landscapes must create a sustainable income. This income is usually gained by the production and sales of milk, cheese and meat (Glasser et al., 2012).

The main factors affecting livestock production are genetic potential and nutrition. In order to introduce goat herds to different areas that need grazing services, there must be a profound understanding of the components involved, both from the ecological aspect and

from the agricultural aspect. In order to combine agricultural production with goats in different landscapes, it is very important to choose the breed that will consume the desired plant species as well as being able to produce under the limiting condition of landscape-use restrictions (herd size, grazing pressure, limited supplementation, etc.) (Glasser et al, 2012).

Conservation genetics indicates that the ability of a species to evolve and rapidly adapt to new conditions is related to the genetic diversity it possesses. A highly uniform species may be very well adapted to its specific ecological niche, but unable to survive when conditions change (e.g. Ross-Gillespie et al., 2007). The same is true at the population level. In accordance, in livestock both within and between population/breed diversity are key factors for ensuring the ability of a specific species to adapt to rapid change (Marsan et al., 2012).

Local breeds, adapted to a variety of agro-climatic conditions and husbandry systems, are at the same time the most threatened, and the ones most lacking information on their risk status. One third of local Mediterranean breeds are at risk, while the risk status of another third is still unknown. Many breeds at risk suffer from low productivity, e. g. low milk yield in dairy cattle, but possess valuable adaptation to sometimes harsh local agro-ecologic and climatic conditions (Nardone, 1992). These characteristics are those most interesting for research and exploitation in a changing environment, and should not be lost (Marsan et al., 2012).

For these very many reasons I decided to select this department. As I have mentioned above, the impact of war over three decades which have devastated all of Afghanistan's (ethic, economic and agricultural) infrastructures and at the same time as people have been struggling daily, I was learning, theoretically, how these problems might be solved in countries where conflicts over resources are not the major concern. Through all of my experiences, my observations, my intellectual pursuits and the understanding of sustainability I perceived that local knowledge was rarely taken into consideration. Therefore, when I started my doctoral research at the Department of Agriculture at the University of Sassari, I began to compile a specific bibliography on the scientific

qualitative research methods, the evolution of science and the in-depth aspect of local knowledge.

The development model from the seventeenth century which guided the productive processes for the following three centuries and organized the world according to mechanics, mathematics and scientific method, was based on the Reductionism and the Mechanistic Scientific Paradigm stimulated by Newton's physics, Bacon's scientific methodology and Cartesian mathematics. Human intervention in natural processes encompassed only short term vision of the needs and modified the natural resources adapting them for his own purposes (Ciancio, 1997). So, as Shiva (1990) mentioned, Man "in a mindless effort to transform nature without a thought for the consequences, destroys the innate integrity of nature and thereby robs it of its regenerative capacity". In the agricultural sector the use of fertilizers and pesticides, the introduction of farm machinery, the development of hybrid strains increased production capability of plants (Trautmann et al., 1985). Modern methods in animal breeding applies antibiotics, growth hormones and other chemicals in order to increase productivity. The forest science in this context was only timber harvesting and attempted to bend the forest to the needs of mankind, taming and cultivating it to leave room for woodlands (Ciancio, 1997). Thus, due to the spread of intensive (industrial) agriculture, many small farmers, preserving traditional farming knowledge were unable to cope with the processes of industrialization. Trautmann et al., (1985) wrote: "As agriculture has become more intensive, some farmers have become capable of producing higher yields using less labor and less land". The poorer farmers were excluded from the agricultural sector, and migrated to cities and joined the working class in factories. The knowledge they had received and developed through years of work on agricultural practices, was no longer required because mechanization and monoculture agricultural would recruit few community members. Technology in the absence of traditional knowledge and severe compression of agriculture, regardless of the natural chain, inflicted extensive damages on the environment and left negative effects on agriculture, ethnic and economic aspects. This

generated dis-harmonies in the natural and environment equilibriums with serious consequences “Environmental impacts have increased, including potential degradation of the soil and water resources vital to both farm productivity and human health.” (Trautmann et al. 1985). Also Gulzardi and Shabani (2013) mentioned “several adverse effects of agriculture on the environment”, that might not be so well known to the general public.

- *The several adverse effects* significantly degraded the physical and chemical characteristics of the soil, as well as changing the balance between vegetation and soil microorganism biodiversity (soil erosion).

- They brought an adverse effect on water quality, discharge of nutrients into rivers, leaching nutrients and pesticides into groundwater, contamination of surface and groundwater and finally they created salt water.

- They caused desertification, penalizing the soil creating too much pressure on the land.

- They caused deforestation, to achieve their targets of interest. The first adverse effects in the tropics led to severe extinction of certain species.

- They increased greenhouse gases and created climate change.

- They reduced the Earth's genetic resources, creating genetic erosion and the destruction of natural habitats.

- They caused damage to wildlife habitats.

- They created imbalance in the social society fabric.

In summary, desertification, deforestation, the overall geological factors, weather, human biology and human life, are threatening the biodiversity of species playing also a role in the

global warming. The consequences of the climate changes, amongst the many challenges, are the rising of the sea levels, the increase of the incidence of pests and diseases, the changing of the rainfall patterns, and all of the above have brought about an increase of abnormal events.

Reductionism

The concept of modernity which is based on the reductionist and mechanistic science, has induced mankind to study and manage the resources for individual and independent advantages and needs.

Contemporary scholars have struggled against these phenomena by writing articles, books, holding national seminars and conferences, resulting eventually as important challenges to be addressed in the Rio International Conference (1992).

At the Rio+20 World International Conference held in 2012, the following decisions were taken:

- a more integrated large-scale approach to land - sea conservation
- having the communities at the center of the biodiversity policies
- reducing environmental pressures
- improving knowledge

Postmodernism

Postmodernism, in Oppermann's (2008) consideration, with the "conjunction of mindscapes and landscapes can indeed stimulate ecological awareness and generate new insights about the inseparability of existence."

The twentieth century thinking goes in-depth into system complexity and components interaction. Components interaction are crucial for sustainable development of natural resources in order to "meet the needs of the present without compromising the ability of

future generations to meet their own needs" (Rio+5 1997). In forest system the importance of these interactions is considered studying particularly the structure, the composition and ecosystems functionality.

My research curiosity has developed, having grown-up within Afghanistan war and drought problems, becoming more and more aware of the harshness of the international environmental problems and of the importance of local knowledge, that stems from the accumulation through the centuries of the observation and perception of individuals and communities in their day by day activities and practices while interacting with natural resources to meet their needs and solve their problems.

I have particularly considered the following three aspects of the issue.

First, having observed, collected information on and perceived environmental problems, I was curious on how restoring local knowledge could be integrated into a practical context in a way which might add meaning to agro forestry conservation.

Second, having perceived the problems of Afghanistan, where war and drought have made havoc of natural, social and economic situation, I was curious about how restoring local knowledge can make a positive difference in the social lives regarding the preservation of it's agro forestry component.

Third, largely based on my own experiences as a human and researcher, I became curious about how restoring local knowledge as a culture heritage provides context for agro forestry development.

2 LITERATURE REVIEW

2.1. Knowledge

Knowledge generation becomes a social procedure that emerges from communication and discussion between different people, networks, and communities (Long and Long, 1992;

Thompson and Scoones, 1994; Agrawal 1995, 1996). Knowledge systems concern the way people understand the world, and interpret and apply meaning to their experiences (Wiersum, 2000).

Knowledge relates to the whole system of concepts, objectives, interests, beliefs, perceptions and access to information and resources that people hold about their environment. This includes people observation and measurement of phenomena, how they set about solving problems, and how they validate new information. It also includes the process whereby knowledge is generated, stored, applied and transmitted to other people (Feldman and Welsh, 1995). In other words, knowledge is generated and transmitted through interactions within specific social and agro-ecological contexts.
Knowledge systems are dynamic, people adapt to change their environment, and absorb and assimilate ideas from a variety of sources (Warburton and Martin, 1999; Islam, 2012).

As we examine specific forms of investigation and knowledge creation in different nations and different groups of people, we can allow for the existence of diversity in what is commonly defined as western or indigenous (Agrawal, 1996), as better described in the following paragraph.

2.2. Expert Knowledge

We can discover different definitions about expert knowledge because different scholars have presented their ideas and viewpoints, introducing terms like the *Scientific Knowledge System*, the *Special Knowledge* and the *Western Knowledge*.

Warren defines the latter as “international knowledge system generated by universities, research institutions and private firms.” (Agrawal 1995).

Scientific Knowledge System (SKS) is essentially in explicit format; it can be articulated in grammatical statements, mathematical expressions, specifications, manuals, and so forth. It can be transmitted formally and easily (Rahman, 2000).

Robert Chambers' view about *Scientific Knowledge* (SK) is: “Power and wealth in cities worldwide have absorbed experts, sources and needed research facilities in order to produce and disseminate knowledge. Knowledge of these modern centers is considered scientific, advanced, valid and enjoys premium technology”.

If the ideas, theories and concepts are transferable, mobile and not tied to a singular community they can be named *Scientific Knowledge* (Kloppenburg, 1991).

Agrawal (1995) stated “Science is an open system whose adherents are always aware of the possibility of alternative perspectives to those adopted at any particular point of time”.

Howes and Chambers (1980) emphasized, “science is openly systematic, objective and analytical and advances by building rigorously on previous achievements.”

In brief, the *Scientific Knowledge System* generated by Universities, Research Institutions and Private Firms, advances by building rigorously on previous achievements. It is open, systematic, objective, analytical, transferable and mobile.
Such knowledge is built through a complex process of selection, rejection, creation, and transformation of the information and observation, and it is inextricably linked to the social, environmental and institutional contexts in which it occurs (Arce and Long, 1992).” (Wiersum, 2000).

2.2.1. Local Knowledge

Local Knowledge is a collection of facts and it relates to the entire system of concepts, beliefs and perceptions that people hold about the world around them. This includes the way people observe and measure their surroundings, how they solve problems and validate new information.

Local knowledge is the knowledge that people, in a given community, have developed over time, and continue to develop. It is:

- based on experience,
- often tested over centuries of use,
- adapted to the local culture and environment,
- embedded in community practices, institutions, relationships and rituals,
- held by individuals or communities,
- dynamic and changing.

Local Knowledge is unique to every culture or society; elders and young people possess various types of knowledge; women and men, farmers and merchants, educated and uneducated people all have different kinds of knowledge.

- **Common knowledge** is held by most people in a community; e.g. almost everyone knows how to cook rice (or the local staple food).
- **Shared knowledge** is held by many, but not all community members; e.g. villagers who raise livestock will know more about basic animal husbandry than those without livestock.
- **Specialized knowledge** is held by a few people who might have had special training or an apprenticeship; only few villagers will become healers, midwives or blacksmiths.

Local Knowledge includes the processes whereby knowledge is generated, stored, applied and transmitted to others. The term "local knowledge" seems least biased in terms of its contents or origin. As it embraces larger bodies of knowledge systems, it includes:

1 Indigenous knowledge
2 Technical Indigenous knowledge
3 Traditional knowledge
4 People knowledge
5 Traditional ecological knowledge

As emphasized by Rahman (2000), "Many definitions have been proposed for *Local Knowledge* (LK), but all of them are incomplete, because the concept is relatively new and still evolving (Johnson 1992, Wavey 1993, Berkes 1993, McCorkle 1994, Quiroz 1996,

Berkes and Henley 1997). Literature in related fields uses various terms interchangeably to designate the concept of *Traditional Knowledge* (TK), *Traditional Knowledge Systems*, *Traditional Ecological/Environmental Knowledge* (TEK), *Traditional Ecological Knowledge and Management Systems* (TEKMS), *Indigenous Knowledge* (IK), *Community Knowledge*, *Rural Peoples' Knowledge, Indigenous Ecological/environmental Knowledge* (IEK), Local *Ecological Knowledge* (LEK) *and Farmers' Knowledge* (FK)".

Local Knowledge is strongly rooted in regional culture and traditions, and it is still used in local economies (Iovino, 2011). This knowledge is recurrently identified as an important component in sustainable farm development (Isaac et al., 2009).
Local Farming Knowledge, particularly in adaptive agricultural systems, is created within the community (Raedeke and Rikoon, 1997), particularly the local knowledge regarding the most favorable species selection, planting densities, and cropping schedules for agroforestry systems (Isaac et al., 2009).
Maweu (2011) wrote: "Various groups of people in different parts of the world perceive and relate with the environment in their own peculiar ways. Their divergent perceptions, interactions and knowledge are largely determined by their different world-views and their environmental ethics. IEK may be considered as a sub set of the wider Indigenous knowledge and it is always specific to a particular community. For many traditional communities, *Indigenous Knowledge* forms a holistic world-view, which is inseparable from their very ways of life - their cultural values, spiritual beliefs and customary legal systems". Nazarpour (2011) mentioned Williams and Molina that have defined *Indigenous Knowledge* as follows: "*Indigenous Knowledge* is the learning methods, understanding and attitude to the world which is the result of experience and solving problems according to test and error by local people. It has grown during a long period of time and it has been transferred from one generation to other generation in hereditary form".

Dei (1993) defined *Indigenous Knowledge* as "common sense and ideas of the local people about the everyday realities of living, result of direct experiences, it includes the cultural

traditions, values, beliefs, and world-views of local people. It is also a holistic and inclusive form of knowledge."

Indigenous Knowledge reflects a society's intimate understanding of its ecological and social environment and has been handed down by cultural transmission (Wiersum, 2000).

LEK is knowledge held by a specific group of people about their local ecosystems. It is labeled "ecological" because it concerns the interplay among organisms and between organisms and their environment (Olsson and Folke, 2001).

TEK is knowledge and values which have been acquired through experience, observation, from the land or from spiritual teachings, and handed down from one generation to another. On the other hand, it is a system of knowledge developed by a given culture to classify the objects, activities, and events of its universe (Wenzel, 1999).

Farmers' Knowledge is an implicit part of their everyday action (Feldman and Welsh, 1995). People obtain information from their own farming, practices and natural resources used, from observations and experimentation.

The format of TKS is mostly tacit – hard to articulate with formal language. It is embedded in the experiences of indigenous/local people and involves intangible factors, including their beliefs, perspectives, and value system (Rahman, 2000 and Islam, 2012). Also as Berkes (1999; Lobe and Berkes, 2004) emphasized: "As a complex of knowledge, practice, and belief, *Traditional Knowledge* tends to be experiential and closely related to a way of life. It is multigenerational and is passed on orally, rather than through book learning."

TEK is accumulated over generations and passed on by word of mouth and by direct experience (Thomson, 2000). Most traditional knowledge information is presented in anecdotal form (Morley et al., 2011).

Banuri (1990) (Banuri and Apffel- Marglin, 1993), using a 'systems of knowledge' framework, find the distinguishing characteristics of *Indigenous Knowledge* (which they call *Traditional Knowledge*) to be situated in the facts that: it is embedded in its particular

community, it is contextually bound, it does not believe in individualist values, it does not create a subject/object dichotomy and it requires a commitment to the local context (Agrawal, 1995).

Indigenous/Traditional Ecological Knowledge is a cumulative body of information/knowledge, beliefs and practices evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment (Berkes et al. 2000, Berkes 1999 and Lobe and Berkes, 2004), Olsson and Folke 2001; Islam, 2012).

The definition of two kinds of *knowledge system* shows some differences: what are the differences between LK and SKS and how could we examine them? Here are the opinions and achievements of some scholars. Agrawal (1995) states that "a dichotomy between LKS and SKS may be made on substantive grounds, because of the differences in the subject matter and characteristics of local and scientific knowledge, and methodological and epistemological grounds. It is because these forms of knowledge employ different methods to investigate reality and contextual ground, and local knowledge is more deeply rooted in its environment" (Chambers, 1980; Warren, 1990; and Islam, 2012). The Table 1. shows some comparisons between local and scientific knowledge.

Table 1 Comparisons between local and scientific knowledge styles (Source: Islam, 2012; Tsuji and Ho, 2002).

Local knowledge	**Scientific knowledge**
Lengthy acquisition	Rapid acquisition
Long-term wisdom	Short-term prediction
Powerful prediction in local areas	Powerful predictability in natural principles
Weak in predictive principles in distant areas	Weak in local areas of knowledge
Models based on cycles	Linear modeling as first approximation
Explanations based on examples, anecdotes, parables	Explanations bases on hypothesis, theories, laws
Classification: • "a mix of ecological and use" • non-hierarchical differentiation • includes everything natural and supernatural natural	Classification: • based on phylogenic relationships • hierarchical differentiation • excludes the supernatural
Type of data: Subjective, Qualitative, Diachronic	Type of data: Objective, Quantitative, Synchronic
Data collection: Slow and inclusive	Data collection: Fast and selective
Data storage: Oral	Data storage: written
Learning: Storytelling, Hands-on, experimental	Learning: Didactic Reading, experimental
Management: Consensus-based, self-regulated, LK- based, Resource users collect and utilize data (decentralized, grass roots)	Management: Top-down policies, heavily regulated and externally enforced, Science-based, Scientists collect data to be used by centralized bureaucracy

Some of the emphasized differences between TEK and SK have been overstated in the literature.

TEK and SK can be used as complementary tools to investigated and resolve environmental issues.

Many academics hold different views on how TEK and science create knowledge, and whether or not they are, in fact, different in their methods of knowledge acquisition. Agrawal (1995) and Tsuji and Ho (2002) purport that "there are no real differences between science and TEK, and that the accepted differences are due to political rather than to epistemic factors. Furthermore, science is becoming more holistic and interdisciplinary, while TEK holders are becoming increasingly familiar with scientific methods and approaches through political, cultural and educational influences". Thus, attempts to define or differentiate between science and TEK have failed for two reasons (Agrawal, 1995 and Tsuji and Ho, 2002). The first is that both knowledge systems are highly heterogeneous. The second is that both knowledge systems are highly dynamic, evolving over time (Islam, 2012).

It is incorrect to assume that TEK is subjective, while western science is objective. Both TEK and SK are based upon the collection of data, however, the difference between the two knowledge systems relates to the interpretation of the data (Tsuji and Ho 2002).

Another difference between TEK and western science that has been emphasized in the literature (Johnson, 1992) is that western scientists stress the use of quantitative measures while practitioners of TEK accumulate qualitative data. Although the above scenario may be representative for many cases, it is not true for all cases. Clearly, some TEK is quantitative in nature, but one must remember to separate observation from interpretation (Tsuji and Ho, 2002).

The utility of TEK, internationally, has been further strengthened by the Brundtland Report (World Commission on Environment and Development [WCED], 1987), the "Agenda 21" of the Rio de Janeiro Conference (United Nations [UN], 1993) and the Convention on Biological Diversity (UN Environment Program [UNEP], 1992).

It is not surprising that the collection of TEK requires a relatively large amount of time because TEK data are based on observations and experiences. For annually recurring events, for example, of observations and/or experiences do not occur during a specified time period, the researcher has to wait a whole year to have another opportunity to acquire that specific knowledge (Tsuji and Ho, 2002).

Western educators have recently become more receptive to experiential and hands-on educational approaches, as used in the teaching of TEK. Evidently, the gap between learning strategies for TEK and mainstream society is decreasing (Tsuji and Ho, 2002).

TEK is clearly part of a societal process and subject to peer critique through shared lives and experiences. In addition, both science and TEK seek to explain phenomena through universal assertions and laws. Both also employ observation, logic, and authority to create knowledge. (Tsuji and Ho, 2002).

TEK and western science should be viewed as two separate but complementary sources of information and wisdom, where practitioners of both would benefit from a reciprocal flow of knowledge (Dewalt, 1994; Stevenson, 1996; Riedlinger and Berkes 2001 and Tsuji and Ho, 2002).

Freeman (1992) states that "the nature of ecosystems and their inherent complexity is a poor match for conventional deductive, reductionist science. Therefore, it has been hypothesized that TEK with its holistic approach might be able to offer insights into complex, nonlinear systems. There are four general ways in which TEK might complement or supplement conventional scientific approaches in addressing complex environmental issues. In fact, utility may be related to taxonomic, spatial, temporal, and social cultural frames of reference".

Reciprocity is the keyword to success (Tsuji and Ho, 2002).

Johnson (1992) and Islam (2012) argue that: "The local knowledge and scientific knowledge are structured by systems of classification, sets of empirical observations about local environments and systems of self-management". Some aspects of traditional

ecological knowledge (Berkes et al., 2000) are relevant to sustainable management of forest resources (Iovino, 2011).

Thomson (2000) writes "Traditional ecological knowledge, as an area of study, initially involved the eliciting and analyzing of the terminologies by which people in different cultures classify the objects in their natural and social environments. In recent years, the emphasis has changed from such classification-oriented studies to focus on understanding the ecologically sound practices that contribute to sustainable resource use among indigenous peoples".

To intensify the understanding of the need to conserve natural resources, local knowledge and scientific knowledge can interact (Berkes, 1999).

The involvement of local people in collaborative research projects creates feasibility for complementary utilization of scientific and traditional knowledge (Berkes and Folke, 1998; Berkes et al., 2000; Lobe and Berkes, 2004).

The use of traditional knowledge in the last decade or so indicates that indigenous peoples and local communities have become more guarded about their knowledge and have started to use it politically and strategically for territorial claims (Berkes 1999, Ford and Martinez, 2000).

Berkes (1999), (Lobe and Berkes, 2004) stated that: "The trend is towards research projects based on traditional ecological knowledge that are participatory in nature, with the community becoming a partner in the cooperative process of knowledge creation and sharing, as opposed to being the object of research".

Management according to locally defined rules, institutionally supported by the users, and the adoption of flexible and diversified cultivation approaches, is based on constant monitoring of the system's feedback, ability to respond to the variations of the resource (Ciancio and Nocentini, 2002).

Iovino (2011) wrote that Susmel (1959) said, while referring to logging methods based on local knowledge and allowing for a small group unevenaged structure of the forest, on the other hand aimed at a balanced, normal uneven aged structure i.e. "to create an uneven-

aged structure, with specific features, to a certain degree different from those considered typical of the fir-beech mixed forest. More precisely, while the overall distribution of trees in diameter classes follows the well known exponential law, the forest shows a structure with small groups, that intermingle without overlapping".

In the Southern Apennines (Calabria) a selection felling by small group based on local knowledge is practiced in the *Sila* pine forests (Ciancio et al., 20s04, 2005 and 2006), in Aleppo pine forests in Cosenza's Northern Ionian coastal area (Ciancio et al., 2007), in beech forests mixed with silver fir in the *Aspromonte* mountains (Iovino and Menguzzato, 2004), in beech forests of the *Aspromonte* and the *Serre Vibonesi* (Ciancio et al., 2008; Marziliano et al., 2009; Iovino, 2011).

Systemic silviculture, by integrating tacit knowledge with scientific learning, brings out the potential of local traditional silvicultural knowledge (Iovino, 2011).

Local and traditional ecological knowledge are used for many community-based conservation projects, because it is the need for Environmental Conservation Programs to involve local people's knowledge and interests in their projects (Lobe and Berkes, 2004).

Mcneely and Schroth (2006) explained that: "Indigenous agroforestry systems maintain a level of biodiversity that is lower than that of the original forest but higher than that of monocultures, and that they provide suitable habitat for a number of forest-dependent species".

Warren (1991) maintains that "Scientists, policy-makers and development project planners are increasingly convinced of the need for protection and conservation of indigenous knowledge of natural resources. Such knowledge is considered relevant because its use incorporates three types of values":

- encyclopedic value, indigenous knowledge systems involve a large variety of information on options for using and managing natural resources, which are not yet described scientifically;

- efficiency value, indigenous knowledge provides information which can be blended with professional knowledge in making the process of technology generation and transfer more effective;
- emancipation value, the incorporation of indigenous knowledge and practices in development projects supports efforts to enhance active participation and to stimulate self-determination of local communities (Wiersum, 2000).

Agrawal (1996) emphasized that "Indigenous knowledge forms the capstone of several convergent trends in social science thinking and development administration practice. Also successful development strategies must incorporate indigenous knowledge into development planning." We must be gathered and document indigenous knowledge as it is essential to development.

Brokensha et al. (1980), in their first major work on indigenous knowledge explain the necessity of using indigenous knowledge for development. Also, for developing sustainable forest management local knowledge is considered an important element (Wiersum, 2000). *Indigenous knowledge* is an important natural resource that can facilitate the development process in participatory and sustainable ways. It is now recognized that IK is essential for sustainable development. It is extensively acknowledged and positioned as an important part of sustainable development (Rouse, 1999).

Kothari (2007) argues that "it has stronger critical insights and practices to offer to a sustainable community than modern science".

Forest management systems are closely interlinked with a community's cultural system (Wiersum, 2000; Umans, 1992).

Appleton et al. (2001) argue that: "IKS can be termed as science, because it is generated and transformed through a systematic process of observation, experimentation, and adaptation.

The term Indigenous Knowledge has been used in different disciplines, such as sustainable development, environmental studies, agriculture, rural development, aqua-culture, animal

husbandry, social sciences, health science, cultural studies, language and linguistics, and many other branches of social sciences".

IK covers numerous components and aspects, which make it wide and complex. It includes: agriculture and horticulture, astronomy, forestry, human health, traditional medicines and healing, knowledge of animals, fishery and ecological systems, sustainable use of natural resources and the environment, traditional classification systems for living, learning systems and oral traditions, spirituality, symbols, traditional arts and culture, designs, symbols, scientific and ecological methods, crafts, music, dance, songs, stories, foods, medicines and wellness (or disease-prevention), and products (Brascoupe and Mann, 2001; Hoppers, 2004). Such knowledge systems are cumulative, representing generations of experiences, careful observations, and trial and error experiments. In the last analysis it is the cultural heritage of indigenous peoples.

The incorporation of indigenous knowledge in developmental planning is a courtesy to the people concerned; it is an essential first step to successful development; it emphasizes human needs and resources (Ver Beek, 2000); it makes the adaptation of technology for local needs possible; it is the most efficient way of using western 'Research and Development' in developing countries while preserving valuable local knowledge; it encourages community self-diagnosis and heightens awareness; it leads to a healthy local pride; it can use local skills in monitoring and early warning systems and it involves the users in feedback systems, for example, on crop varieties and animal breeding (Agrawal, 1995).

Today for sustainable resource use and balanced development we need to focus on indigenous/traditional Ecological knowledge as pivotal above all (Agrawal, 1996). Agrawal (1995) emphasizes also "In the past few years scholarly discussions have characterized indigenous knowledge as a significant resource for development, because it has permitted the holders to exist in harmony with nature, allowing them to use it sustainably, it is seen as especially pivotal in discussions of sustainable resource use". The focus on indigenous knowledge and production systems heralds a long overdue move. It represents a shift from

the preoccupation with the centralized, technically oriented solutions of the past decades that failed to alter life prospects for a majority of the peasants and small farmers in the world (Agrawal 1995, 1996). In the face of evidence that suggests contact, diversity, exchange, communication, learning and transformation among different systems of knowledge and beliefs (Levi-Strauss, 1955; Wallerstein, 1974 and 1979; Wolf, 1982), it is difficult to adhere to a view that separates indigenous and scientific/Western knowledge (Agrawal, 1996).

Local knowledge has developed through the centuries, it can define community's uniqueness, and help showing its relation to the world. So communities must nurture, preserve, protect and pass it on to the next generation because it can tie the past to the future (Brascoupé and Mann, 2001).

More and more local people are demanding recognition for the right to control their own knowledge. Some communities are actively working to preserve their IK. They are collecting and recording oral traditions and knowledge and they are devising ways to make the knowledge more relevant to young people. Others are taking a legal route to prevent exploitation of their IK. However, finding long-term sustainable solutions to preserve and protect IK has not been easy. (Brascoupé and Mann, 2001).

Accordingly, for the development process and sustainable use of nature resources, local knowledge is of particular relevance to the following sectors and strategies:

- **agriculture**, knowledge related to crop selection, intercropping, planting times
- **animal husbandry and ethnic veterinary medicine**, knowledge of breeding strategies, livestock characteristics and requirements, plant uses to treat common illnesses
- **use and management of natural resources**, knowledge of soil fertility management, sustainable management of wild species
- **health care**, knowledge of plant properties for medicinal purposes
- **community development**, common or shared knowledge provides links between community members and generations; and

- **poverty alleviation** knowledge of survival strategies based on local resources.

Why does Local Knowledge need protection?

Because LK has a wide range of commercial and scientific uses, local people's knowledge of medicines, sustainable use of the environment and their cultural practices and arts become increasingly valued by people outside local communities (Brascoupé and Mann, 2001).

In particular, lifestyle changes have hampered transmitting knowledge from the elder to the younger generations.

The collection and storage of indigenous knowledge in archives should be complemented with adequate dissemination and exchange among interested parties using newsletters, journals, research community and different networks (Warren et al., 1993).

Preserving, protecting and nurturing indigenous knowledge is challenged by many factors that particularly motivated this research:

- some communities do not know what traditional knowledge they possess.
- many communities do not know how to go about identifying and protecting it.
- there are few national and international laws that help local communities preserve and protect their knowledge in a way that reflects their traditions and customs (Brascoupé and Mann, 2001).

Furthermore one needs to have a greater in-depth insight to incorporate these two systems of knowledge as Warren et al. (1993) underlined.

Ten years ago, most of the academics working in the area of indigenous knowledge came from the fields of anthropology, development sociology and geography. Thus most writers on indigenous knowledge suggest that local populations possess highly detailed and richly complex information about agriculture, agroforestry, pest management, soil fertilization, multiple cropping patterns, health care, food preparation and so forth. Today important contributions are also being made in the fields of ecology, soil science, veterinary medicine,

forestry, human health, aquatic science, management, botany, zoology, agronomy, agricultural economics, rural sociology, mathematics, fisheries, range management, information science, wildlife management and water resource management (Agrawal, 1995).

Many local knowledge systems are at risk of becoming extinct. This is because globally natural environments are rapidly changing and there are fast-paced economic, political, and cultural changes.

Traditional systems are able to integrate knowledge accrued over time with sustainable criteria (Iovino 2011)

Local knowledge is relevant at three levels of the development process.

- Obviously, it is most important to men and women, old and young, in the local community where the bearers of such knowledge live and produce.
- Development agents (CBOs, NGOs, Governments, Donors, Local leaders and Private sectors' initiatives) need to recognize, value and appreciate local knowledge in their interaction with the local communities. They need to understand exactly what it is before it is incorporated in their approaches. They also need to critically validate it against the usefulness of their intended objectives.
- Finally, local knowledge forms a part of the global knowledge. In this context, it has a value and relevance in itself. Local knowledge can be preserved, transferred, or adopted and adapted elsewhere.

In the forest management area a number of scholars suggested to involve local knowledge as Wiersum (2000) wrote, "local communities were seen to value forests for cultural reasons in addition to utilitarian reasons. Alongside these emerging insights into specific forest-related needs of local communities, it was accepted that the fulfillment of such needs is best assured when local communities are actively involved in forest management. Local communities not only exploit forests to meet a variety of household needs but they also actively manage forests and trees. Local people, on the basis of local needs and knowledge, may develop their own indigenous methods for forest utilization and management".

Religious and spiritual perceptions of the environment have an important role for the of conservation forests systems. The maintenance of sacred forests is a clear manifestation of such cultural perceptions (Wiersum, 2000).

Wiersum (2000) stated that "The terms Professional Forest Management and Indigenous Forest Management should not be considered as referring to two systematically different approaches to forest management, but rather to empirical variations in social and technical arrangements for forest management, because local institutions may involve regulations on the controlled use of these resources, as well as measures to consciously protect resources and to enhance the production capacity and regeneration of the resources".

The last two decades have seen increasing attention given to incorporating indigenous knowledge of forest management in formal forestry, three different perspectives on this issue may be distinguished: an adaptive change, an institutional change or a paradigm change.

These three perspectives incorporate in specific ways the three types of values of indigenous knowledge identified earlier. The 'adaptive change' and 'institutional change' perspectives incorporate the encyclopaedic and efficiency values of indigenous knowledge, respectively (Wiersum, 2000).

For many people around the world, including a majority of the indigenous people who live in the Amazon rainforest of Peru, texts are inaccessible, remote and threatening. However, Amazonian people have a long tradition of expressing themselves in embroidery, paintings, sketches, handicrafts, dance, storytelling and musical performances (Singhal and Flaherty, 2006).

Today, documentation of traditional local breeding knowledge must be added to community-based management of animal resources, which links the empowerment of livestock-keeping communities with the sustainable use of breeds (Kohler-Rollefson, 2003). Documentation of the indigenous knowledge of livestock keepers about animal breeds and breeding (IK-AB) should be an integral part of the work of rural development projects, institutions and organizations (Kohler-Rollefson, 2003) for the following reasons.

- It can be a source of information about the existence of breeds that scientists have overlooked and which may have unrecognized advantages and potential. IK-AB provides an opportunity for identifying these breeds and their special qualities.
- Piecing together the history of a breed is a means of tracking changes in land-use and agricultural production patterns.
- Documentation of IK-AB also puts on record the intellectual contribution of the farming and pastoral communities that created the breeds. Such testimony is a prerequisite for negotiating benefit-sharing arrangements and can preempt attempts by outsiders to exploit, appropriate or even patent these genetic resources.
- Recognition of local communities as stewards of important farm animal breeds and genetic resources is a source of pride to them (Kohler-Rollefson, 2003).

Indigenous knowledge of animal breeding is made up of various concepts and practices used by livestock breeders to influence the genetic composition of their herds. It includes:

- cultural concepts on the uses of animals (general breeding objectives)
- local preferences for certain characteristics, such as color, size, behavioral patterns and disease or drought resistance (specific breeding objectives)
- selection practices for certain qualities (castration, culling, offspring testing)
- pedigree-keeping
- social restrictions on the sale of genetically valuable breeding animals that lead to closed gene-pools (Kohler-Rollefson, 2003).

In the rest of text we will use the term local knowledge in a broad sense inclusive of most of the references above.

2.2. Qualitative research and photo elicitation

2.2.1. Qualitative Research

Qualitative research represents the process of observation and the collection of information where the researcher uses his/her senses (eyes for looking, ears for hearing, tongue testing, nose for smelling and hands for handling) with the assistance of other physical tools. To support this activity during the research tools and instruments such as tape recorders and cameras are used to collect information in order to widen the analysis and share the outcome with the community.

Qualitative research is a naturalistic inquiry, as the data collection strategies used are interactive in the discovery of the natural flow of the events and processes. Most qualitative research deals with people's individual and collective social actions, beliefs, thoughts and perceptions. It consists of a set of interpretive material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos of itself. At this level, qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of phenomena, or interpret them, in terms of the meanings people bring to them. (Denzin and Lincoln, 2011).

The key idea behind qualitative research is to learn about the problem or issues at hand from the participants and engage in the best practices in order to obtain that information. The backbone of this research is an extensive collection of data, typically from multiple sources of information.

Much qualitative research is interview based. Different types of qualitative interviews are described, particularly in sociology and related disciplines, where interviewing is a well-established research technique. Three main types can be distinguished: structured, semi structured, and in depth interviews.

There are various ways of recording qualitative interviews: notes written at the time, notes written afterwards, and audio-taping. (Britten, 1995)

Britten (1995) emphasized "Qualitative interviewing is a flexible and powerful tool which can open up many new areas for research".

Using photography in qualitative research builds on the unique properties of photographic articulation, interpretation and use, employing the inherent ambiguities of photographic imagery (Schwartz, 1989). Photographs and accompanying narratives provide a basis for ongoing investigation of qualitative methods to inform intervention approaches (Fleury et al., 2009). Byers (1964) describes: "the photograph is not a message in the usual sense. It is instead, the raw material for an infinite number of messages which each viewer can construct for himself". Photo-interviewing, used in conjunction with traditional ethnographic methods of data collection, enhances our ability to understand the meaning of everyday life of community members (Schwartz, 1989). Qualitative research is a situated activity that locates the observer in the world.

With respect to photo elicitation we need to recognize that the photograph is not simply a source of information, of details that can be read by the informant. Rather, it is part of a collaborative interaction between the interviewer and interviewee in the production and analysis of data. So photo elicitation enlarges the possibilities of qualitative research.

2.2.2. Photo elicitation

Photo elicitation is based on the simple idea of inserting a photograph into a research interview. This has a physical basis: the parts of the brain that process visual information are evolutionarily older than the parts that process verbal information (Harper, 2002; Oliffe and Bottorff, 2007).

Photographers participated actively in the civil rights movement of the 1960's . They then used those skills in somewhat less immediately political kinds of essays-exploring

communities, occupations, subcultures, institutions-that have a sociological intent (Becker, 1974).

Since several decades, scholars and practitioners of visual sociology, visual anthropology and visual communication keep focusing on the visual documentation (Barnhurst et al., 2004; Griffin, 2001; Wang, 2003).

Figure 1. Images A, B, and C used in Stepping Stones project in order of use in photo-elicitation interview (left to right)[b].

Figure 1 *Photos used as samples in a well known photo-elicitation text*

When conducting photo elicitation inquiries (PEIs), researchers introduce photographs into the interview context (Collier and Collier, 1986; Harper, 2002). Photos are the bridge between researcher and interviewee, apportion **of** information and observation are easier by using photos. They motivate interviewees to speak of their real world and daily activities, they create a comfortable space for a comprehensive history of their actual life. They have a compelling effect upon the informant, the ability to prod latent memory and to stimulate and release emotional statements about the informant's life. They make a collaborative emotion in the mentality of the interviewee who gives information about what is significant in his/her daily practices and activities. In fact photos depicts previous/earlier events in their lifetimes. Moreover they create and establish a sharing empathy between the interviewee and the interviewer. Photo-elicitation is an effective qualitative method to reveal people's cultural characteristics. Benefits of using this method include:

- elicitation of rich descriptions that can be more comprehensive than other qualitative methods,
- access to deeper elements of human consciousness through photo as compared to words,
- the ability to reveal people's experiences, and
- the ability to investigate how breeders understand the context of goats rearing (as revealed in the photo).

Carolsson has argued photos can provide a window into "the way people experience and relate to the world surrounding them," meaning they can reveal intimate dimensions of the connection between self and society, culture, or history and perhaps even "complex expressions of the photographer's relation to the world." (Morley et al., 2011).

A variety of reasons exists to use photo elicitation in research. Above all, Harper has argued that, "images evoke deeper elements of human consciousness than do words." Photos can stimulate memory in different (and unknown) ways compared to verbal interactions, potentially because they allow people to reconnect the past with the present in different ways. These positive effects can increase both the quantity and the quality of explanations provided by participants.

Photo elicitation can build a communication bridge (and rapport) between the researcher and the participant, because images act as a common ground that can be understood by both parties.

This in turn provides structure and reduces the awkwardness sometimes encountered during interviews where the researcher and participant do not know each other well. Photos also encourage participants to become storytellers, since cultural norms dictate that people use them to tell others about events that occurred in the past.

Researchers have made other arguments about the value of using photo elicitation in studies, including: photos can help describe situations more easily, can extend "personal narratives that illuminate viewers' lives and experiences, especially when viewed in a group setting;" can help prompt interviewers to ask specific questions they may not have otherwise

considered including asking for data that may be “invisible to the researcher but apparent to the interviewee”. Morley et al. (2011) sed that: “Photos can help participants reflect on their beliefs and express their feelings” and can triangulate conclusions in connection with other data collection methods (Morley et al., 2011).
Several researchers (Cappello, 2005; Clark, 1999; Horstman and Bradding, 2002) encouraged investigators to integrate visual methods of data collection (photos and drawings) into interviews to make them enjoyable and not like a test in school (Epstein, 2006). Recently, visual research has become a common technique because of its user-friendly and relatively inexpensive technology (Epstein et al., 2006).
Photographs also provide opportunities for the interviewee to narrate and explain, rather than answer direct interview questions (Oliffe and Bottorff, 2007).

The most common experience conducting PEIs is that photographs spurt meaning that otherwise might have remained dormant in a face-to-face interview. The images may not contain new information but can trigger meaning for the interviewee (Collier, 1967; Schwartz, 1989 and Ibáñez, 2004). In other words, data generated from PEIs go beyond the normal scope, evoking deeper elements of human consciousness, leading to the appearance of meaningful data which capture a greater range of experiences than that generated in regular words-alone interviews (Harper, 2002; Ibáñez, 2004; Oliffe and Bottorff, 2007; Fleury et al., 2009).

Photos may either be taken by the researcher, for a more theory-driven study, or by the participants, for a more inductive study. The content of the photos is not as important as what the participants say about them; the primary goal is to use the photos as tools to stimulate the expression of ideas (Morley et al., 2011).

The photo elicitation is considering two possible approaches:

1- Autodriving - Photos are taken by the interviewees.

2- Reflexive Photography - In this method photo are taken by participants and the informant will speak about the photo reality, what it means and what is the reflection of this photo in the interviewee's life (Clark, 1999; Epstein, 2006; Bignante, 2010; Morley et al., 2011).

Researchers who were guided by a particular conceptual frameworks also took the photographs, as they were aiming at exploring a particular concept (Diamond and Hestenes, 1996; Foster et al., 1999; Weinger, 1998). Finally, researchers who were exploring particular places (rural home care) took the photos, as the photos served not only to facilitate conversation but also as a mapping observation to represent particular features of the area (Epstein et al., 2006).

Photo-elicitation has been used as a central technique for studies that focus on social class and organization, community and historical ethnography, identity, and culture (including interpretations of "work"). When conducting photo elicitation interviews PEI, researchers introduce photographs into the interview context. PEI in its various forms can challenge participants, trigger memory, lead to new perspectives, and assist with building trust and rapport (Epstein et al., 2006).

Collier (1957, 2009) emphasized these perspectives for photography.

- Photography is a long-established tool in scientific research, whereas anthropologists have generally used the camera solely to support their findings by illustration.
- Photographs can trigger responses that might lie submerged in verbal interviewing.
- Using photos with interviews sharpens participants' memories and elicits longer and more comprehensive interviews.
- Photographs can help interviewee to provide compact and definitive answers.
- Photographs can be stimulating the interviewee to speak and to share a lot of information and they can help to overcome the fatigues during the interview.
- Photographs are an aid to open a discussion.

- Photographs can influence the structure of an interview. They create a friendly, intimate and sincere atmosphere. Photographs as an interview aid seem well adapted for a rapid collection of specific information on the methodologies and on the identification of the interviewees' origin and personality.
- A photograph is a re-statement of the reality; it presents life around us in new, objective, and arresting dimensions, it can stimulate the informant to discuss the world about him as if he is observing it for the first time.

In short, photo elicitation interview seems an interview process that elicits more information (Harper, 2002).

In different fields of research such as sociology, education, mass communication, and anthropology researcher photography is applied. Photographs provide information about settings and factual information and can be used to probe participants about how they define their world (photo-elicitation as a research method).

Scholars from different academic departments have presented their idea and viewpoint about photography so we can discover their definitions and statements as follows.

- Photographs probe sharpened interviewee memory, reduces the area of misunderstanding, and compels informant's to stick to the truth (Collier, 2009; Harper, 2002 and Epstein, 2006).
- Photographs serve as a means of communication between the researcher and the participants.
- Photographs triggered discussions and revealed contrasts and tensions among the viewers (Ibáñez, 2004).
- Photos are intimate dimensions of the social (Ibáñez, 2004).

Byers refers to photography as an art and a precise machine-made record of a scene or a subject (Schwartz, 1989).Finally, in research, the photographs are tools, when combined with other data sources, that can improve qualitative research. Collier (1957, 2009) found that a photograph commands interest, deflects digression, and helps the interview to proceed on its meaningful way.

According to Fleury et al. (2009) the use of innovative visual methods fostered the research process and provided rich data describing resources, values, strengths, concerns, and supports.

The PEI allows the researcher into the interviewee's home and life through photographs in different ways and with different results than when the researcher is physically present. Thus, the PEI can create a more intimate situation than other methodological approaches. PEI practitioners also grapple with issues of confidentiality and ethics (Ibáñez, 2004).

PEI seems to act as an "ice breaker" activity to create a comfortable space for discussion (Epstein, 2006).

Harper (2002) emphasized the notion of "breaking the frame", according to which photographs should be presented from an "unusual angle" to allow participants to explore a new view of their social world. (Epstein et al, 2006).

Photography and sociology have approximately the same birth date. Social exploration grew out of the use of photographs to report the news and to record important social events (Becker, 1974).

Recently, PEI has been employed in various disciplines, including nursing (Riley and Manias, 2003), social work (Weinger, 1998), psychology (Salmon, 2001), education (Rasmussen, 2004), and geography (Smith and Barker, 2000). PEI has been used with various populations as well. Originally, it was used by Collier (1967), an anthropologist who studied migration caused by technological and economic change. Sociologists Harper (1997, 2002) and Banks (2001) have also used PEI as a research method. Although Collier, Banks, and Harper researched adults primarily, a new group of researchers using PEI with children is emerging (Epstein et al., 2006).

PEI has been used mainly in ethnographic and social studies research (Banks, 2001; Harper, 1997) and has involved "using photographs to invoke comments, memory, and discussion in the course of a semi-structured interview" (Epstein et al., 2006).

Briefly, of the 140 studies in Sociological Abstracts database mentioning the keyword photo, 80 used photographs as an integral part of their research. In the past 10 years alone,

social science researchers have used photographs across an array of disciplines and topics. The majority of the studies using photography specifically use the PEI alone or in combination with other methodologies. These numerous studies show social scientists are using photos and PEIs in a variety of ways and in diverse substantive fields.

Schwartz (1989) writes, “The use of still photography as a research method has been fruitfully addressed by a number of scholars (see in particular Bateson and Mead, 1942; Becker, 1974; Byers 1964, Caldarola, 1985, Collier, 1967; Wagner, 1979)”.

Several elicitation studies focused on the meaning of local cultures. Interviews inspire subjects to define how they interpret the events depicted (Harper, 2002). When two or more people discuss the meaning of photographs they try to figure out something together. This is an ideal model for research (Harper, 2002).

There is a variety of different approaches in doing PEIs. Researchers plan ahead the author of the photographs. Some researchers, who are also talented photographers, take the photographs, develop, organize, and present them to the interviewee. For example, Harper (2001) used aerial views of farmland and historical photographs to interview farmers about their identity and community and took detailed, close-up photographs in a rural workshop. When researchers are the photographers, cameras can help researchers better interact with the people they are studying (Collier, 1967; Schwartz, 1989; Ibáñez, 2004),

By using *photography interview,* a researcher can gain "insights into breeder’s lived experiences", which were previously overlooked, rejected or silenced. (Singhal and Flaherty, 2006). Photo elicitation can be regarded as a postmodern dialogue based on the authority of the subject rather than the researcher (Harper, 2002; Picker, 2005)

In brief, photo elicitation can be considered useful in studies that are empirical and rather conventional, it may add validity and reliability to a word-based survey.

Regarding the uses of photography in social research, one can roughly distinguish three uses:

- as illustrations placed in support of a written text,
- as a document,

- as a visual indicator of the subjective perception of a situation from the subjects observed (Gariglio, 2010).

2.3. Goat breeders in Sardinia

The goat was among the first animals domesticated by humans, even before 10,000 B.C. The geographic occurrence of this phenomenon, combined with the location of the cradle of the first known civilizations (Mesopotamia), contributed to the direct connection of the goat to all phases of life of the people who created and developed civilization in the area now known as the Middle East (Boyazoglu et al., 2005). For the first agricultural people, the goat was as important as the buffalo for the Indians. Goat is the cattle of the poor people.

Goat breeding in Italy is mostly restricted to the country's southern and insular areas, which are characterized by harsh environment and climate conditions. There are 920 thousands goats in Italy producing 48 million liters of milk per year, making it the fifth country in goat milk production in the European Union after France, Greece, Spain and Bulgaria (Faostat, 2008). Sardinia, the second Mediterranean island (24,000 km^2) with about 290 thousands heads is the leading Italian region in goat milk production and the center of one of the most numerous Mediterranean autochthonous goat breeds, from the neolithic age (Macciotta el al., 2002). Sardinia's traditional goat breeders use animals of the Sarda breed or crossbred with the Maltese (Macciotta el al., 2002; Usai et al., 2006). The breeders keep their flocks on extensive pastures all year round.

Sardinia is located between the 39th and 41st degrees N. The main climate is the typical Mediterranean climate, with dry and hot summer (daily averages over 20°C) and precipitations (annual average under 800 mm) concentrated mainly during the cold season (daily averages around 10°C) but, due to the great altitude variability (hilly area is over 60%, mountains extend over 18% and range well over 1500 m), there is a great climatic variability. Rounding last years EUROSTAT figures, roughly less than half of the islands area is "utilized agricultural area", half of this is not ploughed and used as livestock

(especially rustic or dual purpose cattle, dairy sheep and goats) livig there permanently, free rangeing, feeding on the available natural resources. Breeders in Sardinia are spread over the whole island, with some concentration in the mountainous areas of the southeast.

Sheep and goat husbandry is an important sector of agriculture because it can play a significant role in converting organic matter (pasture, yields, forage crops of grass and legumes, and agriculture remainder) that has no food value to humans into more valuable food products such as meat, milk and other by products, providing energy, proteins, sugars, vitamins and minerals for human health and survival. Goats originate industrial products such as wool, mohair, cashmere, fiber, hide, bone, blood and manure. As Lombardi (2005) and (Ruiz et al., 2009) summarized "Small ruminants have the capacity to turn low quality forage into products of a high feeding value."

Goat farming production now has a successful niche market both for its specificity and for its functional properties. Goat milk is sold for direct consumption but it is mainly used for cheese-making, processed on farm or cooperative processing plants, as traditional hard and smoked cheeses. It is used as 'drinking milk' in human nutrition and it is an alternative to cow milk because of its chemical composition, digestibility and low allergenicity (Mowlem, 2005; Pulina and Nudda, 2002).

Nickel-Kailing (2012) emphasized that "Goat's milk has some very different properties. First, goat's milk does not contain agglutinin, a protein that makes the fat globules cluster together. In other words, it is 'naturally homogenized' and the cream does not automatically rise to the top like in cow's milk. The milk protein forms an easily digested soft curd and there are only trace amounts of casein protein present, which can cause allergic reactions. Children and adults who are lactose intolerant can often process goat's milk better than cow's milk. And finally, goat's milk has approximately the same mineral content as cow's milk and yet it is higher in calcium and a wide range of vitamins". Goat meat is high in protein and it is lower in fat, calories, saturated fat, and cholesterol than chicken, beef, pork, or lamb. Therefore for those who are health conscious, it is an important substitute and

moreover it is extremely flavorful. Ruiz et al (2009) wrote: “Sardinia’s goat and sheep breeders face many challenges because they raise their animals in a harsh environment, yet the animals yield valuable milk-based products. It is for that reason that these systems have traditionally been related to grazing, thus increasing the usefulness of farmland unsuitable for cultivation such as mountainous areas (Mena et al., 2005; Papachristoforou and Markou, 2006) or semi-desert regions (Degen, 2007). Small ruminant grazing systems offer a number of environmental, sociological or nutritional advantages. According to several authors (Pearson and Ison, 1987; Cavallero and Ciotti, 1991) controlled grazing has several positive effects on the environment, as it favors the conservation of the wide variety of vegetation resulting from the different environmental and management conditions, the upkeep of a quality pasture, the conservation of a heterogeneous landscape, among others the prevention of soil loss due to erosion and the prevention of forest fires.” Grazing goats contribute to the removal of the undergrowth, reducing and avoiding the risk of forest fires (Boyazoglu et al., 2005). Livestock, by controlling the shrubby vegetation, can reduce the competition with trees for water, since goats are the right animals and much more capable of consuming woody species (they can utilize practically all plants grown in the Mediterranean forests). So they can control sprouts and thus assist in the thinning and management of coppice forests (Liacos, 1980).

Liacos (1980) argues that “domestic animals are instrumental to the functioning of Mediterranean ecosystems because they contribute to nutrient cycling and thus to an increase of their productivity. Because of low temperatures in winter and the lack of sufficient moisture in the summer, decomposition is slow, resulting in the accumulation of organic material on the ground. This can lead to devastating wildfires. Grazing animals can reduce this material and thus prevent forest fires”.

Goats have the biggest increase in number among the livestock species during the last 20 years (Dubeuf and Boyazoglu, 2009, Faostat, 2013). Increased numbers do not necessarily indicate a positive development of productivity, but simply reflect the fact that many people

in rural areas of the developing countries try to survive by keeping small animals such as goats. (Aziz, 2010).

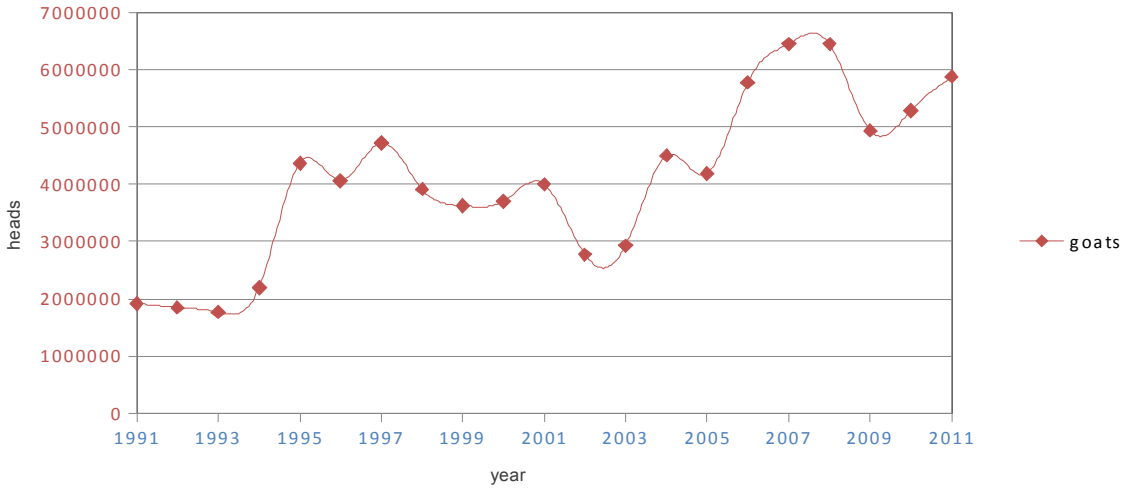

Figure 2 *Goat population from 1991 up to 2011 (Faostat, 2013)*

Goat breeders are rearing their herds somehow like their ancestors reared them. Not linking up with the contemporary needs (and obsessions) for technology and 'change', they have a dis-valued perception of themselves and of their knowledge, though they actually have a rich and complex perception of their interaction with the environment. Great part of the local knowledge that had been acquired and accumulated as cultural heritage in the past centuries is already lost. New generations haven't taken over in the last decades and hence the knowledge loss process is speeding up. Specific efforts are required to try to recover and to understand how that knowledge can be documented, preserved, valued and continued.

3 MATERIALS AND METHODS

The research developed extends, as previous chapters illustrate, over a vast and composite range of domains: from root level issues questioning the sense and meaning of science and knowledge, through the understanding of local knowledge and of qualitative research, up to the specificity of Sardinia goats breeders knowledge and self-perception. The research actually is a non-ending learning process, developed progressively integrating different methodologies as the work develops. Understanding, testing and explaining qualitative research represents, *per se*, a contribution in the field of forestry (and of animal science) since the approach is not even conceived yet in this domain. The methodology applied to perform the testing part of the work is, in the end, a personal composition of different proposals, following some of Seidman's (2012) interviewing approach supplemented by photo elicitation (Collier, 1957).

3.1. Conducting, processing and analyzing interviews

With the understanding of the importance of the local knowledge, it is essential to personally engage in a dynamic living process with goat breeders while focusing on their communication practices. The most important task of the *researcher-in-charge* is to take into consideration the different interacting social and cultural factors, such as the breeders' attitude, their reactions with goats, the benefit values and the farm practices in their day to day life.

Interviews are useful techniques for eliciting direct evidence from the participants on their experiences on animal husbandry. The interviews were used to prompt interviewees to articulate their conceptions of goat rearing and to allow them to describe each photograph in relation with their daily experiences.

Whether the discussion was based on designed or semi structured interviews, it was crucial to understand how knowledge was represented, through their actions and performances. Therefore the nature of the qualitative inquiry the researcher adhered to for this study was useful in the search for the understanding generated from the following question: "How can photo-elicitation be meaningful in restoring local knowledge for the conservation of agro-forestry ecosystems in Sardinia?"

While the scientist did not reciprocate through physical work, he emotionally and cognitively participated in breeders' world-view.

Given that, traditionally, the breeders are oral communicators, observation, videotaped interviews and sound recording appear as natural research tools to document their stories and opinions.

The following steps, out of Seidman's (2012) approach, have (or should have) been applied for raw data elaboration.

- **Managing the data**

  The material generated by the interviews is organized to make it accessible. Particular attention is required for keeping track of breeders through the participant information forms, making sure the written consent forms are copied and filed in a safe place, labeling audiotapes of interviews accurately, managing the extensive files that develop in the course of working with the transcripts of interviews and keeping track of decision points in the entire process.

- **Recording Interviews**

  Spoken words are transformed into a written text to study. As the primary method of creating text from interviews is to record the interviews and to transcribe them. Each word of a breeder speaks reflects his consciousness (Vygotsky, 1987), Although inevitably the researcher's/interviewer's consciousness will play a major

role in the interpretation of interview data, that consciousness must interact with the words of the interviewee recorded as fully and as accurately as possible.

Recording offers other benefits as well. If something is not clear in the transcript, the researcher/interviewer can return to the source and check for accuracy. In addition, interviewers can use recording to study their interviewing techniques and improve upon them.

- **Transcribing interviews**

In working with the material, it is important that the researcher starts with the whole (Briggs, 1986). Preselecting parts of the recording to transcribe and omitting other tends to lead to premature judgments about what is important and what is not. Once the decision is made not to transcribe a portion of the recording, that portion of the interview is usually lost to the researcher. So, although labor is saved in this alternative approach, the cost may be high.

Punctuation is one of the beginning points of the process of analyzing and interpreting the material (Kvale, 1996) and must be done thoughtfully because participants do not speak in paragraphs or always clearly indicate the end of a sentence by voice inflection.

- S**tudying, reading, and analyzing the text**

Interviewing generates an enormous amount of text. The vast array of words, sentences, paragraphs and pages have to be reduced to what is of most significance and interest (McCracken, 1988; Miles and Huberman, 1984, Wolcott, 1990). Most important is that reducing the data be done inductively rather than deductively.

For this reason, in this research, the transcription was realised with an open attitude, seeking what emerges as important and of interest from the text.

All responses to the text are interactions between the reader and the text (Fish, 1980; Rosenblatt, 1982). In the transcription phase, it is important to let the interview breathe and speak for itself, to make sure that the interests of the researcher is not infused with anger, bias, or prejudice.

- **Marking what is of interest in the text**

The first step in reducing the text is to read it and mark with brackets the passages that are interesting.

In this stage of the process, judgment about what is significant in the transcript has been exercised. In reducing material, a preliminary analysis and interpretation was carried out. That judgment depends on the researcher experience, both in the past in general and in working with and internalizing the interviewing material; it is the most important ingredient the researcher brings to the study.

- **Sharing interview data: profiles and themes**

The goals of the marking is to discover what is of interest in the interview transcript, to reduce and then shape the material into a form in which it can be shared or displayed (Miles and Huberman, 1984).

Reducing the data is a first step in allowing the researcher to present the interview material, then to analyze and interpret it. It is one of the most difficult steps in the process because, inevitably, it means letting some parts of the interview material go.

- **Rationale for crafting profiles**

There is no right way to share data. Some researchers argue for reliance on words, others consider graphs, charts, and matrices more efficient. In this research, crafting a profile or a vignette of a participant's experience was selected as an effective way of sharing interview data and opening up one's interview material to analysis and interpretation.

Crafting a profile using the words of the breeders permitted to represent the participant in his context, to clarify his intentions concerning goat breeding.

Profiles are one way to solve the problem the researcher has of how to share what learned from the interviews. The narrative from a profile allows the researcher to transform this learning into telling a story.

- **Steps in crafting profile**

The first step in crafting profile is the generation of a new file from the original version of the transcripts, in which only the marked passages of interest are transcribed. It is important never to cut up the original transcript because it serves throughout the study as a reference to which the researcher may turn for placing in context passages that have been excerpted.

In the next step the new version is read with a more demanding eye, verifying which passages are the most compelling to craft a narrative based on them. In the narratives, the first person was adopted. The researcher must also be alert to whether he made the participant vulnerable by the narrative itself.

- **Profile as way of knowing**

The profiles are included in the annex of the thesis. In order to present the material clearly, hesitations, repetition and idiosyncrasies in breeder's speech were eliminated. Grammatical corrections were made while at the same time remaining "respectful of the content and the intended meaning of the participant's words" (Fuderich, 1995).

In addition to the profiles' speaking powerfully for themselves, profiles were explored, and comments were added on the salient issues, pointing out connections among profiles.

Interviews are a form of “social invention” that provide “raw data” for the interpretive analytical process, the composition of impressionistic written text and the video narrative storyline.

The data collection implied a full commitment during the interviews and observations. An authentic record of events through the video camera and note taking was made. Personal reflections on the activities were noted separately. Each interview was transcribed, coded and translated faithfully from Italian into English. “Respectful of the content and the intended meaning of the participant’s words”(Seidman, 2012).

Each interview and contextual video footage was archived in QuickTime files. All data were transferred from the master mini-DV tape cassettes. A broad coding of the video footage was made, marking the scenes that would have been useful for the narrative video and shots to be shown to the breeders. The written observations were later transcribed into word-processing documents along with the written different modes of oral and practical knowledge. During the transcriptions and the coding processes, notes and ideas of specific episodes were recorded in order to be used in future observations or interactions with the people involved in the research. Furthermore the researcher investigated the breeders’ conceptions (ideas and beliefs) on the long term prospects in order to determine the optimal interaction between goats and the related complex eco systems.

3.2. Photo elicitation

Photo elicitation is used as an interview process in which the interviewees discuss about the photos they were submitted with. In this research, photo elicitation interview was a data collection technique that focused on photograph as an ice breaker activity to create a comfortable space for discussion and to open opportunities to involve breeders in different ways so as not to limit their responses. Photo elicitation is a visual method that uses photographs to allow the breeders to represent through images the different dimensions of

their lives, including their knowledge and experience about goat husbandry and their social and contextual resources. Schwartz (1989) wrote, “The use of still photography as a research method has been fruitfully addressed by a number of scholars (see in particular Bateson and Mead, 1942; Becker, 1974; Byers, 1964; Collier, 1967; Wagner, 1979)”.

3.3. Materials

Materials used in this research, which assisted and helped to gather all the information included photographs, a camera, a sound recorder, a video camera and a computer.

The video camera served two purposes: (1) it was the primary tool for collecting qualitative data, and (2) as a means of enhancement of the observation skills which produced visual and written data of husbandry practices.

4 RESULTS AND DISCUSSION

4.1. Interview questions

In order to interview the Sardinian goat breeder's, a questionnaire comprising four sections was prepared: 1. Herds feeding resources and breeders agricultural knowledge, 2. Knowledge about animal husbandry, 3. knowledge about ethnic veterinary medicine and 4. Culture value *vs.* economic value facing the poverty alleviation issue, with a set of questions for each.

4.2. Photos used for elicitation

To elicit breeders understanding of sustainable goat production I selected a set of photos focusing on management systems, breeding techniques, feeding practices, health care and knowledge of survival strategies. The set includes fifteen goat pictures downloaded from Google site. coldantlerfarm.blogspot.com

Figure 3 *Example of photos and images used during the interviews*

All photos and images used for the photo elicitation process are collected in a specific annex.

During the interviews the interviewees were asked to state both what was the relationship between the photographs and their daily activities and their opinions related to each photo. Short notes were taken during each interview and the breeders' discussions recorded. All clarifications about goat rearing and experiences were also noted down. When the interviewees considered attentively the photos, they realized how much information and knowledge they had in relation to them. At this stage photographs and films were taken of the breeders for further discussion. Short notes were jotted down, a sound recorder was used, more photos and videos taken for the analysis.

Figure 4 *Breeders photo elicitation interview*

Stepping out of the office

The research effort kicked off thanks to the mediation of Prof. *Gian Carlo Carta* from the *Nuoro Forestry School*. He introduced the researcher to various breeders suggesting interesting collaborative subjects.

The original idea to include breeders from villages throughout Sardinia was abandoned on the grounds that a case study covering a limited area comprising breeders living in three different villages would have sharpened the holistic in-depth investigation the researcher was aiming at.

The interviews were conducted with three goat breeders in different parts of the Province of Nuoro, which is located in the central part of Sardinia, an area where traditional ways of life have been less impacted by other cultures and where topography is suitable for goat rearing and natural pastures.

The selected breeders cover a wide range of ages, there is a young, a middle aged and an older breeder. Certain differences can be related to this characteristic.

The final choice for the field research included the following breeders: (A) Mr Carta Salvatore and his sons, (B) Mr Fadda Natalino, and (C) Mr Cossu Giovanni and his sons. Field work was performed from November 27th to December 4th 2012

When the breeders accepted to be part of the study, the researcher firstly engaged in an effective exchange with them.

Interviews were held at the farms of the respondents who acknowledged the specific aims of the research. A selection of pictures, a camera and a tape recorder were the tools used throughout the interview period. The goat breeders were shown some photographs of goats. The importance of gaining a better understanding of goat breeding in Sardinia was thoroughly clarified. It was also explained that their responses to the interviews were the key factors to this research.

Personal interaction and participation was included in videotaped and sound interviews and observations. As a rule with the use of a video, the interview is perceived as a significant and structured event by the research subjects. The first focused face-to-face encounter with each individual served as a rapport-making process. The interviews revealed themselves as

a highly personal and intimate experience allowing for a human affinity with each person encountered.

A collection of video and sound recorder data as a secondary mode was undertaken in order to accurately document the overall observations.
The function of the video camera allowed for the sharing of the spaces where the breeders were engaged in the implementation of different modes of oral and practical knowledge.

A high level of trust was developed between the scientist and the breeders thanks to their shared intent and synergy. This permitted a faithful observation of the breeders in relation to their work, their relationship to livestock and the challenges they face as traditional breeders in a modern global world. Texts were collected and the code of practice was ultimately traced as a means to study the breeders' behavior and their meaning-making in relation to the conditions that govern the shared meanings of the practices.

4.3 Synthesis of the interviews

The data collected consisted of: one *videotaped interview* and two *sound recorded interviews* with *hand written notes*. Data are available on the Internet rtough the Nuoro Forestry School web sit NuoroForestrySchool.uniss.it/Halim

Breeder (A)

The first interview was conducted on November 27th 2012, with Mr. Carta Salvatore a goat breeder from Lanaitto, a small village in the East of the Nuoro Province. His farm is located in a valley, on the Northern limits of the Barbagia Mountains. He is an experienced and a very well informed goat breeder. During the interview he openly shared his perceptions on animal husbandry. As he related he is following a long family tradition in goat breeding. In fact he is the fifth generation in his family who is in the goat husbandry in the territory. He learnt from his grandfather, his father, his father's uncle and his uncle. Mr. Carta and his

sons work together on the farm. The farm work is exclusively run by the family. In fact each member of the family has the ability to perform the necessary daily work on their farm (management, feeding and processing). Mr. Carta clearly conveyed to the researcher his ability in passing on his local knowledge to his sons, practically and with the day by day experience and through trial and error.

Figure 5 *Stable with trough*

The breeder related extensively on the personal breeding methods. He prefers natural insemination which he allows for only once a year. This method enables the kidding process to continue for longer periods of time which in itself is advantageous for the goat rearing. Mr. Carta acknowledged that his strategies for breeding goats brings him and his family economic benefits during the selling period due to the different age, weight and size of the animals.

Figure 6 *Fence and Stable*

Figure 7 *Breeder during interview in goat's stable*

The processing of the milk is rarely undertaken while the fresh milk is normally sold to cooperatives. Mr Carta uses rennet and simple instruments and tools to process the milk for his limited production of different kinds of cheese. In fact the rennin enzyme from abomasum is known by the breeder for the fermentation process but he chooses to use the rennet which is much more employed nowadays as it is hygienic and effective.

Figure 8 *Tools for processing milk*

Figure 9*Tools for processing milk and Sucammu*

Breeder (B):

The second interview was conducted on the 28th November 2012 with Mr. Fadda Natalino, a goat breeder from Orosei, in the North-Est of the Nuoro Province. His farm is located on a hill side.

Figure 10 *Sarda goat and goats Farm*

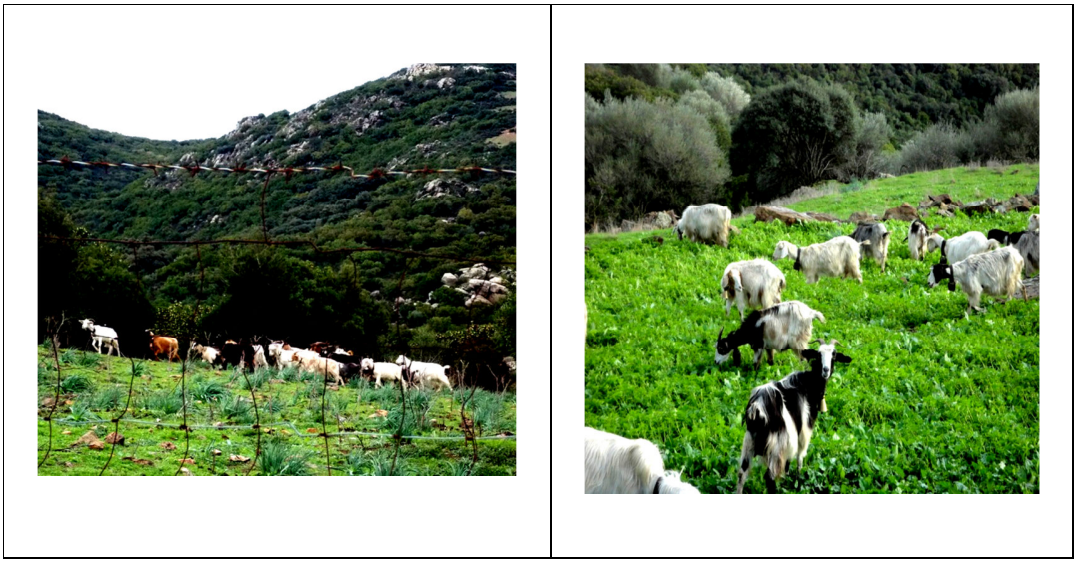

Figure 11 *Goats grazing in range-land*

He runs the farm he bought five years ago, on his own. He brought about changes on the farm by modifying the original stables.

Figure 12 *Hay and animal feed*

Mr. Fadda has never had formal education and he is following a long family tradition in goat breeding. He gains knowledge though daily experiences. Mr Fadda also conveyed to the researcher his local knowledge linked to a cultural heritage shared between animal breeders in Sardinia. He also managed to convey his extensive experience in animal husbandry, insemination, goat kidding, milk processing and health care. Natural insemination is used for its simplicity, convenience and economic benefits. Natural healing plants are also used skillfully by Mr Fadda on animals' broken hooves.

Breeder (C):

The third interview was conducted on December 4th 2012, with Mr. Giovanni Cossu and his sons, a whole family of goat breeders including a daughter from the central part of the Nuoro Province. His farm is also located on a hill side. Mr. Cossu started working on his land approximately 53 years ago and has brought about very many positive changes on his farm. Mr. Cossu and his family started the farming activity from scratch bringing it with the passing of time and working very hard to its current status.


Figure 13 *Milking Machine and Catcher*


Figure 14 *Milk processing and milk processing tools*

He gained extensive experience on dealing with animal health complications and the related milk losses (mastitis and its effects on milk production and its consequences after consumption by humans and animals). The traditional once-a-year mating system is practiced. This allows for a longer milking period (goats are hand-milked) creating economic benefits for the breeder's whole family. Mr. Cossu's sons run a small milk processing plant. As previously mentioned, the whole family works together and the daughter is in charge of the milking and the marketing of the milk and cheeses.

Figure 15 *Cheese making process*

As one of the sons related to the researcher, the head of the family has handed down the overall traditional knowledge of goat breeding to his heirs.

Figure 16 *Cheese making process and Cheese aging room*

4.4. Data analysis

The three interviews have been analyzed separately and assembled with the relevant and related materials: pictures used for discussion, field notes, handwritten considerations describing the social, cultural and general knowledge and the interactions that took place between the researcher and the interviewees. Each photograph was numbered and marked according to the pertinent citations of the verbal recordings concerning the participants' narratives.

These three sources, the recorded transcripts, the video of each individual interview with the related photographs were all used as "raw data" for the analysis. The three interviews were conducted in Italian, transcribed and finally translated into English.

Both the transcripts and the voice-recorded interviews were compared to ensure accurate translation.

Following Seidman's (2012) line of reasoning the analysis proceeded guided by the question: "What did the researcher learn from the interviews, studying the transcripts, marking and labeling them, crafting profiles and organizing categories of excerpts?" The process generated questions like the following and some answers:

- What connective threads were there among the experiences of the breeders that I interviewed? How do I understand and explain these connections?
- What do I understand now that I did not understand before I began the interviews?
- What surprises have there been?
- How have my interviews been consistent with the literature? How inconsistent? How have I gone beyond?

1) What connective threads were there among the experiences of the breeders that I interviewed?

How do I understand and explain these connections?

They all learnt about breeding and goats management from their parents. Although everyone goes to school at least up to the age of 16 if not more, their knowledge concerning breeding is entirely based on the heritage of local culture it is not taught at school. The great similarities among the three breeders, that are not in direct contact between each other, substantiates the perception of this knowledge as local culture.

2) What do I understand now that I did not understand before I began the interviews?

I understand that goat rearing in the Nuoro area is a culture. Goat rearing depends on a functional interaction between breeders, goats and woodlands for a sustainable exploitation

of natural resources, hence breeders work contributes to sustain their territory and its economy. After the interviews, I perceive the value of the culture that the breeders share or could share with the community, if they get an opportunity.

I understand that interview as a method is particularly useful for exploring people's knowledge and experience. I found that photos encouraged breeders to speak and share more information during interview.

3) What surprises have there been?

The surprise for me, coming from a distant and less modernized country, was that here too, breeders and breeders progenies never went to zootechnical schools. Their goat rearing knowledge is learned from their ancestors. Breeders progenies learn directly in the farm with a trial and error approach. Breeders transfer their knowledge and experience to their progeny practically with day by day work.

4) How have my interviews been consistent with the literature? How inconsistent? How have I gone beyond?

Generally breeders information was found to be consistent with the formal scientific literature.

The limited depth of the information that this level of interview can acquire might be insufficient to uncover inconsistencies or contrasts of this type but it is already sufficient to appreciate the value and impact of "how you know" on "what you know".

Knowledge in this context is not perceived as accumulation on information, it is holistic in nature. It is a connections-rich network structure, where the single heads are individually recognized as unique. Eventually the goatherd can choose the goat to the milk, sitting on the milking seat and calling it by its name! The perception that each goat is reacting in its specific ways and requires specific care in the evaluation of symptoms as in the adoption of cures, overheads the notions of average and function in the judgment processes.

5 CONCLUSION

Coming from Afghanistan, with an animal science background, to the "Nuoro Forestry School" (NFS) to develop a PhD research has been a great challenge.

NFS, although still in its very first development stages, strongly recognized the need to deeply revise the current approach to knowledge development and interpretation. Following this line of thought, at the time of arrival, NFS was hosting a researcher in "communication and rhetoric", Dr. Cynthia Vagnetti, as visiting professor. Extending her field of work to a domain intersecting forestry and animal science, brought the focus of the research on goats breeders. This is in facts a very paradigmatic case of traditional conflict that has shed dis-value over an activity (and a knowledge production system) surviving, despite modernity, trough the centuries (and the millenia) within Nuoro province as well as in Afghanistan.

Yet, though the overall directions along which the research moves are well defined and relatively narrow, the path and the specific milestones to reach required -and still require- a lot of work since we are moving beyond conventional disciplinary thoughts and limits. The necessary critical revision of the notion of knowledge implies something more than a simple interdisciplinary work, there is a need for personal engagement in issues and questions far away from the safe grounds of the disciplinary garden. The work performed, assuming an explicitly humble attitude, can not pretend to represent a mature product. It is the result of a very serious and intensive engagement in the chosen research direction.

Naming just the most prominent challenges the first is the language shifts from Dari, to English, to Italian, to some touching contacts with the Sardo. Second is the difficult uncovering of how part of the forestry world in Italy is evidencing and addressing the scientific paradigm change. Next comes the success in (humbly) mastering an out-of-field research method. Finally comes the crossing, contrasting and complementing of the animal scientists 'expert knowledge' with Nuoro goat breeders local knowledge. The work is

focusing on what the world is loosing as this heritage is reducing its reproduction and regeneration capacity!

Necessarily, many specific aspects could not be developed beyond a very initial level.

Having re-framed the domain of science to include previously dis-valued areas, the core of the work is the documentation and the analysis of the interviews personally relating the researcher to the goat breeder's view and perception of the world and of himself.

The interviews are organized as a dialog progressively widening and deepening its scope and are conducted with the help of purposively selected images, as photo elicitation inquiries (PEI).

The inquiry is structured in four sections:

- Agriculture and land use/ Herds feeding resources and breeders agricultural knowledge
- Animal husbandry
- Ethnic veterinary medicine and
- Culture Vs economic value

The interviews have reached three different farms in Sardinia. Detailed transcripts of the Italian dialogues as well as a narrative English version of each interview is attached as document annex. Further documentation is available at: nuoroforestryschool.uniss.it/caprai_nuoresi. The following paragraphs offer a sample of the collected data, organized by interview section.

1) The fist section, initially titled "agriculture and land use", tackles the basic aspects of how the herds are fed and how and how much the breeder directly provides feeding resources trough agriculture.

Sheep breeding needs cultivated land to complete the nutritional requirements and does not take advantage of the availability of shrubs and trees. Goat breeding uses shrub lands and woods as foraging resources. Its requirement for agriculture resources is limited, motivated by the food shortage, that generally happens between the end of the summer and the beginning of the autumn, and the winter food surplus requirement.

Interviewed breeders are from families of old local origin, native of Nuoro province, central Sardinia (Italy). Their families have owned the land they are working on and have passed it over as heritage for more than one generation they received.

They are trying to improve the lands slowly by every day working, extending the cultivated part. Relatively flat areas are freed from rocks and eventually ploughed removing vegetation that had naturally colonized the area.

Their cultivated land is one third of farm area on average, where they cultivate fodder crops as wheat, barley, oats, alfalfa, clover, peas, corn and maize. Most of the breeders are applying "inter-cropping". They are sowing gramineae within legumes to produce high quality fodder (high nutrient content). In addition they apply the rotation system, to increase production volume, to conserve/preserve land fertility and for weeds control. They use hay forage during food shortage and during winter.

The non cultivated part is generally dominated by harsh landscape or wood and shrubs coverage, where only goats graze. A relatively small part of the properties has conditions and grass cover suited for foraging sheep. Goats, the breeders say, are very intelligent and smart, they select the forage and are able to move to the area most suited to the season.

Specific approaches and experiences of the different breeders.

Only breeder (A) has the possibility to plough and to cultivate hay for forage to face winter time. The others (B and C) live on mountainous areas where legal restrictions apply limiting the possibility to plough and cultivate in the farm area, they both say: “goats graze

in pasture all year around and I buy hay forage and alfalfa for winter and for food shortage period."

The breeder who can plough (A) uses intercropping system (gramineae within legumes) to produce forage with high nutrient value, rotation to keep the land free from weeds and to conserve land fertility. The others (B and C) apply rotations in non cultivated land, to conserve land fertility and to have goats graze temporally in different part of the property.

2) The second section of the interview is titled "animal husbandry" and considers all breeding aspects. Subsequent sections will go into some detail.

Sardinia is the most important goat breeding area of Italy. Here the activity has been expanding in the last decades but, as Usai et al. (2006) pointed out, the great part of the breeders work at low intensification levels and with economical limitations. If intensification is regarded as "top level" and sheep breeding as a model, which is the position of traditional extensive goats breeding? Are there values connected with that system that we are losing as it vanishes? All interviewed breeders are rearing *Sarda* endemic goat breed by extensive "low level" systems.

Breeders choose *Sarda* breed because in their territory it is adapted and it has good production and reproduction capacity. It is resistant to diseases and parasites. *Sarda* breed has kept his productive capacity in harsh environment and mountainous areas (Dettori et al., 2009). Breeders are carefully and purposively guiding the mating, they attempt to engage the suitable and fertile buck with the doe which must be fertile and have a soft and round udder. They introduce one buck for every 30-50 goats. A medium weight and medium height buck is sufficient for this purpose, but slightly different criteria guide the different breeders. They select a medium feature, healthy, strong, young and sufficiently robust buck for breeding. They prefer natural instead of artificial insemination, because they think it is easy, simple, safe and economical. Breeder are aware of the insemination times requirements. The months of June and July are the best period for insemination. Thanks to

natural insemination kidding is not compressed in a short period and breeders can manage the process much better. Having kids of different age and different weight, market demand is more easily managed.

The breeders recognize that a goat will be ready for mating because milk production declines, it has pain, the body temperature rises, it starts mounting and bleating. *Sarda* breed has the ability to reproduce twins or more than two. Breeders recognize the symptoms of kidding, they can guess which goat will give birth to twins or even more. In average the herd reproduction rate is two per head. *Sarda* breed has the ability to reproduce two times a year, but breeders prefer only once. As breeders say “If a goat reproduces twice, the lactation period will be two or three months, if it reproduces once, the lactation continues for a longer period, seven to eight months.

While kids get birth, goats produce milk. All breeders milk manually. It’s a team work which is done by breeders and their sons, as breeder said “We usually milk goats together because the milking must be done in a hurry”. They milk twice a day. The lactation period of *Sarda* goats lasts for seven to eight months. *Sarda* goat produces 1 liter or 1.5 liter per day for around five to six months, after the lactation falls. The product is either sold for direct consumption as fresh milk ore processed to make cheese. Two interviewed breeders sell the milk to cooperatives, while breeder (C) has a mini-dairy farm. He processes the milk to make different kind of cheeses: smoked cheese, "*Sardo*" demi-ripe cheese, the so-called "*pecorino romano*", ricotta and fresh products like *sa fruee* or *merca*.

Meat is an important product of Sarda goats. Breeders sell the male kids while female goats slaughter when they get old.

Sarda goat, has a pretty solid, durable and good skin because it is a thin skin, naturally protected with a lot of hair volume. Breeders don’t process goat skin by themselves, they sell it. In ancient times their ancestors used to build containers “for carrying the goatherd daily needs” wineskins, saddlebags, shoes, bags, belts and overcoats.

3) The third section inquiries on knowledge and competence concerning goats health

Breeders are quite confident with goats diseases. In the study area “forty or fifty years ago serious diseases of the goat have been eradicated by vaccines”. Vaccines are still delivered twice a year. Goats suffer digestive problems like diarrhea, gastritis and rheum illness. Goats will lose weight if the diet has a poor nutrient content or because of malnutrition, kids will lose weight when they receive infected milk.

Breeders negligence causes significant illnesses, pests and injuries like mastitis, abortion, rheum, fractures “the effect of falling” and ruptures “the effect of wild animal attacks”.

There are some differences among breeders knowledge about diseases prevention and goats health problems in the area.

Breeder (A)

He pointed out several issues that affected the udder: mastitis, rupture of udder veins, rupture of capillaries and a type of food (due to poisonous herbs or grasses).

He said, mucosa from the nose can be due to very cold weather or to dew and rime ice wetting the grass.

He uses hay for hygiene to prevent mastitis and fungus infection: "If goats consume a bale of hay it is better to put two in the winter because the heat is very important for both adult goats and kids, also they should not have damp where they lie down".

He uses some local medicine for healing specific illnesses. *Crammediu* is a plant which he uses for healing the wounds and injuries (after infusion or decoction the product is preserved in a bottle). A little more liquid is useful for microbes can be provided orally or internally. He uses *Grappa* and Brandy to expel worms. A bit of brandy (just a little now a bit tomorrow) two or three days half a glass of brandy, expels those "tapeworms", cleanses the intestines.

Breeder (B)

He recognizes two sorts of mastitis. A light form from which the animal can healed completely and the case when a more serious infection adds up. Then the udder becomes violet and we call that “black mastitis”. Because of this, a goat can even die, but more often just stops producing milk.

He pointed out that abnormal mucous secretion from the nose and the eyes can be the cause of *Pasteurellosis*, but also these symptoms can be caused by lung parasites or liver parasites.

Interesting is his use of *Ferula* sticks (*Ferula communis Ed.*) to immobilize bone fractures.

Breeder (C)

"*Mastitis*, in my opinion, comes from the dirt. As a matter of fact, there are specific bedding to be used. Lime is spread over the bedding, so that the infection does not spread. Because it's contagious, a sick animal infects those around it.

In the past for curing the mastitis, he would clean the udder and rub it with ash, flour and water "cold lye", which was used to disinfect it, or he resorted to bloodletting. The infection sometimes went away, but the goat did not give milk any more. They had few kids who are born with 4 nipples on the udder. They cut additional two when they are still small, otherwise milking processes become difficult because they lose milk from 4 nipples.

Growth of fleshy tissue inside the mouth “*Sos ispinales*” is a disease that only strikes goats. The infections are like rods of flesh that grow inside the lips in the mouth. It makes the ingestion of food painful, generally does not kill the goats. To cure it they cut these rods from the base, inside the mouth.

"Limping” is other health problem which affects the hooves and caused rot. Apply lime at least once a week or ten days on the stable floor, can prevent limping (Disinfections).

Leaking from the nose can be caused by a fly, which enters the nose and lays eggs, when the larvae grow the goat tries to expel coughing. "It's a very large larva, we call it *verme di corno*".

There are livestock medicinal plants like "*pistiddori*" nettle, but we do not use them anymore. In the past they were used, in the form of poultice.

4) The last section of the interview resorts to more general questions concerning the motivations to keep the activity running: the economic vs the socio-cultural sides.

The economic network that goats breeding sustains involves cheese cooperative workers, brokers, tanners, pharmacists, vets and other less specialized workers.

Breeder (A), has a project that is advancing slowly, he is creating a petting zoo.

Breeder (B), "I always try to do my bests. My favorite task is milking, because it's the moment when I get the real result of my work."

Breeder (C), "The work we are doing is almost the same as in my parents' days. The main difference is in the milk processing temperature: in the past, it used to be kept at 35~37 degrees Celsius. Instead, we bring it to a temperature of 42~43 degrees Celsius, to make it half-cooked."

The interviewed breeders' farms are local extensive goat rearing systems, that they manage with family members. All materials and tools are simple and made from natural sources as wood. In the stable, there are separate places for kids, patient and infected animals.

Breeders and breeder's progenies have never gone to specific breeding schools, they learned from face to face practices and, they learned directly from their parents with day by day experiences.

Goats stay all year round grazing outside, rarely the breeders stop and close them in the stable for two or three days. It may happen due to some temporary natural disasters, like a storm.

Before I started my PhD study in the University of Sassari, I thought: how could a farmer or a breeder increase his farm productivity? With increasing agricultural productivity, how can he meet his economic needs? How can they raise capital? How can farmers meet their requirements?

Studying the bibliography, I observed that it isn't only capital and capitalism which guide the world. There is the community, the society which is making decision. People are a strong part of the nature system. They seek for ecological, economic and ethic sustainability. They are managing sustainable agriculture development. They use their knowledge to make a green world without environmental problems.

Having developed my research, I found out that community based knowledge and perception take advantage of natural resources guide. Intellectual humans are the manager of these systems. They know their problem. They meet their need while ensuring that they leave a healthy and viable world for future generations.

As breeders said, “Goats rearing is a family work. We are continuing goatherd as our ancestor began. We try to sustain our live with day by day working in the farm. We didn’t bring so much difference in our works. During working, we try to transfer our knowledge to our progenies”.

Actually, during interviews I saw, heard, observed, perceived that breeding goat in Sardinia is a culture for breeders. They are not dominated by issues concerning economic benefits. They are thinking about their progenies. They are doing their best for long period productivity of their farm and their natural resource.

Briefly, from goat breeders' interactions with goat, fores, pasture and woodland I learned: there are people, who are working with their natural resource, who are using natural instruments, local knowledge and traditional manner for producing. There are community (breeders), who are thinking about their culture and ancestor heritage. There are community (breeder's family) who are working together for unite purpose. I learned how people exercise every day. How people use their natural resource. How community resolve their problems. How they get experience. How they sustain their life. How they transfer their knowledge and experience.

The analysis of the texts of the dialogues effectively transfers only a limited fraction of the value of the interviews. Listening and possibly looking at the recordings has a significantly greater impact. The intensity of the the breeders passion, their kindness, their availability and interest in explaining and in being understood escapes this analysis while it is a vital part of what the work has documented and can pass over, spread out. The process of "discovering and resolving value, goat breeder's local knowledge in Sardinia" aims to become a continuing work, expanding the documentation work and continuously refining our capacity to communicate, preserve and regenerate its value. This work has opened the road, demonstrating the thickness and consistence of what the world heritage is loosing as the goat breeder's knowledge formation and transmission process becomes more and more un-fit.

Acknowledgements

I would never have been able to finish my dissertation without the guidance of my committee members and the help and support from friends.

I would like to express my deepest gratitude to my adviser, Prof. Roberto Scotti, for his excellent guidance, patience and for encouraging and helping me to shape my interest and ideas.

I would like to thank Dr. Cinthia Vagnetti, for all I have learned from her and for her help and support.

Special thanks goes to Dr. Chiara Rosnati, who patiently corrected my writing and supported me in this thesis research with her suggestions.

I would also like to thank Dr. Giancarlo Carta and the breeders Mr. Salvatore Carta, Mr. Giovanni Cossu and Mr. Natalino Fadda, for their kind willingness during the interviews.

Many thanks to Ms. Flaminia Antonini, Ms. Laura Calgaro and Mr. Giuseppe Pala for English review, my friends Gabriella and Patrizia for their help in transcription the interviews, Dr. Roberto Barbieri and Ms. Veronica Zanfi for their support in video and thesis editing.

My greatest appreciation and friendship goes to Ms. Gina Loi and Prof. Sergio Vacca, my research would not have been possible without their helps.

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ANNEX I

INTERVIEWS

BREEDER A

Mr. Carta Salvatore Interview

Lanaitto - Dorgali, Sardegna, Italy - 27.11.2012

Accompagnato dal signor Giancarlo Carta

A. AGRICOLTURA E USO DELLA TERRA

Ha costituito lei la mandria? Se no, ha significativamente modificato il sistema di allevamento rispetto a chi è venuto prima di lei?

In questo terreno hanno fatto questo lavoro di pastori con le pecore e con le capre e siamo alla quinta generazione. Io ho conosciuto mio nonno, mio padre e gli zii di mio padre che hanno svolto questa attività sempre in questo terreno in montagna e poi coltivando il terreno, i terreni che oggi seminiamo. Prima era un bosco, poi è stato dicioccato - tolto il bosco - e si vive da diverse generazioni. Già io ho lavorato da piccolo con mio padre e oggi mi trovo a lavorare, io con i miei figli,in campagna, a continuare la stessa attività, migliorandoci o cercando di migliorarci piano piano in tante cose.

Prima si faceva la trasformazione del formaggio - il latte si trasformava in formaggio- qui nell'ovile. Oggi, la maggior parte dell'anno, il latte viene conferito ad una cooperativa di Dorgali, che si interessa sia della trasformazione del formaggio, sia della vendita del formaggio.

Quindi noi abbiamo - siamo riusciti a raggiungere - questa serenità economica piano piano perché abbiamo uno stipendio mensile. Ci pagano il latte ogni mese quindi è una tranquillità, da quel lato lì.... economico importante, perché prima quando, i nostri nonni

mio nonno, mio padre e anche io da ragazzo, facevo il formaggio bisognava curarlo il formaggio, poi venderlo. A periodi si vendeva subito, a periodi non si riusciva a venderlo, quindi non c'era un ingresso economico immediato, invece oggi c'è più serenità economica conferendo il latte alla cooperativa.

In quale zone preferiscono pascolare le sue capre?

La capre, come ho detto poco fa, a seconda delle stagioni pascolano in posti diversi.

Quando c'è il periodo freddo, inizia l'autunno che iniziano le prime piogge, quindi nasce l'erba nuova -l'erba fresca- le capre pascolano dentro la vallata nei terreni più puliti, più comodi e poi più avanti andranno a pascolare più nel bosco o nella montagna,ecco.

In piena estate cercheranno i posti più freschi perché il caldo le opprime, le fa stare male.

In inverno pascolano negli erbai che noi prepariamo, che potete vedere qua fuori.

In che misura queste zone sono coltivate? In che misura sono invece aree boschive, di cespugli e prati naturali?

É un'azienda che si estende - è tutto accorpato, tutto un pezzo - per 140 ettari tra il bosco e il terreno pulito.

Ci sono circa 100 ettari seminativi quindi non-bosco, più 40 ettari circa di bosco, ma le capre godono e pascolano anche nel bosco, quindi è un'azienda abbastanza estesa.

Che tipo di foraggio utilizza?

Il foraggio lo prepariamo,lo facciamo d'inverno. Questi erbai che abbiamo seminato nel mese di Gennaio adesso stanno nascendo, vede?

Poi a Gennaio, dal 20 Gennaio fino al 20 Febbraio, quegli erbai vengono pascolati come erba, poi verranno messi a riposo per produrre il foraggio. Quel foraggio si tratta di Orzo e Avena e

Trifoglio perché è un alimento buono e completo e nel mese di Maggio o ai primi di Giugno taglieremo quel fieno che abbiamo di questi erbai nostri. Capito?

Che tipo di mangime utilizza per le sue capre?

Si acquista anche del mangime perché quando,sopratutto durante il periodo del parto, bisogna aiutarli un po' per il sostegno, un po' di mangime, si acquista sempre dalle ditte per forza. Bisogna aiutarle.

Utilizza qualche tipo di consociazione (ad esempio leguminose più graminacee, ...)?

Più graminacee, si più graminacee. Si tratta di Granturco, Orzo, a volte grano.

Si si, leguminose è un medica..? si,tipo fave.. ci sono anche di questi miscugli ma la maggior parte si tratta di Orzo, Piselli, Mais, Granturco.

A che tipo di sistema di rotazione fa ricorso?

Eh, il terreno si coltiva per tenerlo pulito che non vengano le piante infestanti che non le mangiano le capre, allora ogni due, tre anni cambiamo, un pezzo quest'anno un pezzo l'anno prossimo . Per esempio, 10-15-20 ettari un anno, 20 ettari l'anno prossimo, a rotazione sempre, si.

In che stagione affronta la scarsità di cibo per gli animali?

La scarsità di cibo più che altro viene a fine estate, in autunno perché il pascolo è stato consumato e il pascolo nuovo viene quando l'autunno iniziano le piogge. A Novembre, Dicembre si fa, si genera l'erba nuova l'erba fresca. Invece da fino estate, primo Settembre, Ottobre bisogna aiutarle con del foraggio, con del mangime perché in quei tre mesi in particolare c'è scarsità del foraggio.

In genere, fa ricorso ad integrazioni supplementari?

Si, si, si, il mangime in quel periodo, ma il mangime lo diamo anche durante l'inverno per cercare di produrre un po' più di latte perché se il bestiame si lascia allo stato brado senza un aiuto, una capra può dare circa, una capra Sarda -parliamo delle nostre capre - quelle possono dare 1/1,5

litro di latte; se si aiutano un po' nell'alimentazione si arriva a raggiungere anche 2 litri a testa,a capo.

Quindi per alzare un po' quella resa bisogna spendere un po', chiaramente.

B. ALLEVAMENTO DI ANIMALI

A quale varietà della specie appartengono le tue capre?

-Le mia capre sono capre Sarde. Sono capre Rustiche, si dice così : Capra Rustica Sarda.

Ci sono diverse varietà di capre. Più rustiche sono quelle, per esempio nell'Ogliastra, in Sardegna, e noi abbiamo acquistato dall'Ogliastra di Urzulei, per avere quel genere di capre che sono più adatte per questa zona montuosa perché quel tipo di pascolo è adatto per quelle genere di capre; portare delle capre che sono con del buon sangue,che sono migliorate geneticamente, quelle capre avrebbero difficoltà a vivere in questa zona.

Lascia il bestiame al pascolo tutto l'anno? Altrimenti, in che stagione le capre rimangono in ovile?

Si si, tutto l'anno. Raramente stanno in scuderia o che, si fermano e le chiudiamo nel recinto per due, tre giorni se succede un temporale o qualcosa di eccezionale ma se no, sono allo stato brado.

Come vedete è una zona abbastanza tranquilla, il territorio, la pastura e' vasta quindi loro stanno bene, non e' che, perché condannarle a stare nel recinto quando c'è il posto sufficiente.

Di che genere di attenzioni e precauzioni necessitano le capre all'interno dell'ovile?

Eh, bisogna stare attenti che non si crei del fango perché stanno male quindi noi mettiamo del fieno. Se loro hanno bisogno - se 100 capre hanno bisogno - di mangiare una balla di fieno (è sufficiente) noi ne mettiamo due balle di fieno, una la mangiano e così i resti, quello che rimane del fieno, serve per la lettiera così rimangono più al caldo.

Ecco, questo strumento è importante in modo che il bestiame non stia nell'umido, se no, l'umido attira il freddo e così stanno meglio.

Poi ci sono i contenitori per il mangime, i controlli dai predatori e infatti la recinzione deve essere sicura perché di notte devono stare nel recinto per quel motivo.

Che tipo di gestione utilizza nella sua azienda?

La gestione è affidata a me o ai miei figli, ho un paio di figli, che lavorano qua con me.

Ecco, ci diamo sostegno chi più che meno; ci lavoriamo tutti in famiglia, un lavoro a gestione familiare.

Che genere di strumenti e attrezzature tecnologiche utilizza per l'alimentazione delle capre?

No, la tecnologia proprio in questo posto non è utile. Non serve, non è necessario. É un lavoro materiale - da saper fare - con un certo criterio.

Non bisogna trattarle male, non bisogna.. Anzi, il recinto è fatto proprio in diversi box, in diversi reparti proprio per farle star bene, al migliore dei modi.

Per l'abbeverazione c'è facilità nell'ovile?

Si, si c'è l'abbeveratoio , lo trovano loro d'estate (ci siamo passati davanti) e c'è l'abbeveratoio.

E la ventilazione?

No, no, qua è libero. Non stiamo parlando di un allevamento razionale (scuderia,capannone..).

Qua si tratta di capre Sarde allo stato brado.

Quante volte all'anno si riproducono le capre?

Una volta, noi le facciamo riprodurre una volta perché facendole riprodurre una sola volta, avranno 6 -7 fino a 8 mese di lattazione. Se le fai riprodurre due volte avrà due, tre, quattro mese di lattazione.

Utilizza l'incrocio per la selezione del bestiame?

Noi non utilizziamo incroci con altre capre di altre razze, perché non e' conveniente.

L'abbiamo detto prima, in questo posto stanno meglio le capre Sarde, che non le capre migliorate.

Le capre migliorate hanno bisogno di erbai fissi e non vanno a pascolare nella montagna, le capre migliorate, capito? Di altre razze tipo la "Maltese", c'è la "Saneen" , c'è l'"Alpina" .. sono capre che non si adatterebbero a questo terreno. Capito?

Fa ricorso all'inseminazione naturale o artificiale?

Naturale.

Che caratteristiche deve avere un buon ariete per garantire la riproduzione?

Un buon ariete deve essere sempre forte. Bisogna curarlo, quello deve essere sano, ecco. E quando è ,una volte che, noi lo vediamo, fisicamente se è robusto allora per noi è sufficiente. Ma questo e' un ariete di un'altra razza, non è della razza delle mie capre. Sicuramente questa razza di capre che vediamo nella foto è una razza importante perché può dare a mio parere -perché io ho visto altri greggi di amici miei- arrivano a produrre fino a 5 -6 -7 litri di latte addirittura, al giorno. Ma non potrebbero vivere nel terreno della Barbagia o per lo meno, libere.

Un ariete deve avere un'altezza, o che caratteristiche deve avere?

Per la capra Sarda non e' importante, anzi si tratta di una capra che non ha un volume cosi grande. É più minuta che non grande, è una capra media.

Le capre migliorate sono più grandi come costituzione e danno più latte però dovrebbero vivere nei posti più adatti a loro sempre in erbaio, non andrebbero nel bosco,si fermerebbero a piedi

della montagna. Non sfrutteresti certi terreni; noi sfruttiamo questi terreni visto che viviamo ai piedi della montagna e sfruttiamo quel genere di pascolo.

Che caratteristiche deve avere la capra per la riproduzione ed una elevata fertilità?

L'importante è che nel periodo che sta per arrivare al momento della monta siano ben alimentate in modo che i calori quando si sviluppano trovino la bestia sana, forte da poter ricevere l'inseminazione - naturale – perché noi facciamo l'inseminazione naturale.

Da che momento è possibile compiere l'inseminazione?

Già dopo un anno la capre è fertile. Si, tra i 10-12 mesi, dopo un anno è già fertile.

Per quante capre utilizza un ariete (inseminazione naturale)?

Un ariete è sufficiente anche per 60 – 70 capre, può condurle bene.

In che modo riconosce il periodo migliore per l'inseminazione?

A seconde della lattazione che stanno facendo.

Quando devono venire in calore diminuiscono il latte quindi diminuisce la produzione e loro danno dei segnali, sia agitano tra di loro, quindi si capisce anche dall'odore se sente capisci.

Quali sono i sintomi del calore che presentano le capre? Come capisce che sta per iniziare il periodo fertile?

Eh, la vedi, non e' che noi entriamo dentro la capra, noi vediamo il comportamento esterno. Questo comportamento e' il fatto che si rincorrono tra di loro, sentiamo un odore particolare. Loro emanano un odore particolare.

Lascia ariete e capre insieme tutto l'anno? C'è un periodo speciale?

Si cerca di tenerle sotto controllo da Dicembre fino alla fine della primavera, per avere una concentrazione di più nei parti dopo. Se invece lo lasci in mezzo al gregge, non tutte ma qualcuna

, potrebbe venire in calore d'inverno e quindi figliare a metà stagione e quindi compromette la stagione seguente.

Che tipo di inseminazione (naturale o artificiale) è più semplice, conveniente ed economica? Quale preferisce? Perché?

La naturale e' più semplice. Certamente e' più conveniente, anche se un gregge che viene concentrato più viene seguito, più razionalmente....,diversi amici fanno l'inseminazione artificiale anche sulla capra Sarda per avere una concentrazione di agnelli in quel modo, c'è chi fa questo, è a seconda della gestione.

C'è gente che ha 10 ettari di terreno, quindi sfrutta 5 ettari e li lascia di terreno libero, 5 ettari di terreno seminativo; quindi deve sfruttare al massimo quei 10 ettari che ha - e cosa fa?- concentra là i parti,a quel dato mese.

Noi abbiamo la possibilità di avere - abbiamo la fortuna anche di avere - un terreno vasto, non abbiamo problemi di ettari, perché potrebbe essere tranquillamente, il nostro terreno è sufficiente per un gregge di sei anche 700 capre. Potrebbero campare serenamente e bene anche, quindi per noi non e' importante che siano tutte la stessa settimana, tutte in quel mese. Loro vivono da sole, quindi noi meno spendiamo più guadagniamo, il primo guadagno è il non-speso, diciamo. Noi guardiamo in quel lato lì.

Noi stiamo già guadagnando del fatto che quando ce ne sono 20 noi vendiamo 20, quando ce ne sono 10 – 10, quando ce ne sono 50 tutti insieme noi ne vendiamo 50 tutti insieme.

C'è da fare e mangiare tutto l'anno.

Come si fa a sapere quando un capretto nascerà?

Quando vede che la capra e' fecondata dall'ariete sappiamo che la fecondazione dura 5 mesi meno una settimana, quindi 4 mesi e 3 settimane.

Si prepara, la capra, vedi che sta preparando l'apparato mammario, cioè la mammella, si riempie di latte quindi sta per arrivare il parto.

Quali sono gli altri sintomi della nascita del capretto?

Bè, è quella roba naturalissima che noi conosciamo bene perché la capra quando è gravida si allarga il ventre e tutto l'apparato si riconosce perché inizia a camminare più a fatica e per arrivare quel momento questioni di giorni, perché ci sono capre più sviluppate e capre meno sviluppate.

La capra è un'animale che, frequente, dà più di un capretto.

La maggior parte delle capre figliano - producono - due capretti a differenza delle pecore le capre è più raro che producano due agnelli. Ci sono anche le pecore con parti gemellari ma la capra ha una percentuali più alte di parte di gemellari, quindi la gravidanza si note di più perché la pance è più luminoso.

Se una capra partorisce gemelli, come fai a saperlo prima?

Mah, noi non facciamo ecografia, quindi. No, a vederla così apparentemente?

Si, quando ha una pancia grande si pensa che ne ha due, tre. Se poi la si tocca, noi la prendiamo la tocchiamo quando e sta vicino al parto, si toccano nella pancia, sopratutto se si toccano la mattina, la mattina quando di notte è restata chiusa nel recinto non ha pascolato, quindi ha meno scarto, tocchi veramente la costituzione, tocchi due scheletri del feto, dà.

É un'esperienza che hai?

Si, si, si, la conosciamo bene avendo quasi 55 anni, ho fatto questo lavoro da ragazzino di 11 -12 . É un'esperienza, oggi si va per esperienza non è più..la conosciamo anche mentre cammina, non c'è bisogno di toccarla se ne ha uno o due dalla pancia.

Quali tipi di prodotti fornisce la capra in aggiunta al capretto?

Eh, il latte e la carne. Poi alla fine la capra ci dà quelle tre rese: il capretto, il latte

Il latte che va trasformato in formaggio oppure in "frue", che noi chiamiamo "frue" e' quel formaggio molle.

In media quanto latte una capra produce in un giorno?

Al giorno, una capra Sarda - parliamo delle nostre capre - rende un litro, un litro mezzo al giorno.

In un anno 7 mesi (circa -6 mese , 5 -6 mesi) può fare questo litro,litro e mezzo ; poi scende, scenda a ¾. La lattazione dura 7 anche 8 mesi.

Per una buona capra Sarda quanto tempo e' la lattazione?

La lattazione 7 – 8 mese anche,si.

Qual'è il periodo migliore?

I primi mesi dell'anno sono, una media diciamo così di un litro, quando si va primavera aumenta il latte. Quando arriva all'estate cala, quindi c'è un arco in media che va in salita e poi scende.

Ma, una capra che ha una buona lattazione dura di più?

Eh, tra l'una e l'altra ce ne sono diverse che resistono di più ma viene a cessare, chi più chi meno, la produzione. Però cessano pressoché uguali perché il periodo di fecondazione è lo stesso.

Invece per il formaggio quali sono gli altri prodotti che si producono dal latte?

Dal latte e viene fatto il formaggio oppure la "frue ". Anziché fare il formaggio asciutto, secco, si fa una cagliata, ecco. Si mette il caglio e si mangia così morbido con il pane. Poi dopo estratto il formaggio si fa bollire e rimane il siero e dal siero si può fare la ricotta; è un sottoprodotto diciamo dopo il formaggio. Quelli sono sottoprodotti del latte di capra.

Che tipo di materiale si usa per la fermentazione?

Il caglio.

Solo caglio?

Si, il caglio. Noi abbiamo conosciuto sempre quello.

Prima come si faceva?

Prima di avere il caglio chimico che oggi troviamo in bottiglia si usava il caglio del capretto stesso che preparava il capraro. Quando macellava il capretto, teneva il caglio e lo faceva asciugare.

É esattamente una parte dello stomaco del capretto. É diversa dagli altri animali ruminanti perché contiene degli enzimi più forti, utili per coagulare.

Allora lo facevano asciugare, lo legavano dentro uno straccio, lo mettevano in salamoia e si bloccava e non si guastava, lo rimettevano appeso. Ogni mattina quando mettevano il contenitore di rame con il latte immettevano quello straccio contenente il caglio nel latte, aspettavano che quagliasse, lo toglievano e lo riappendevano.

Anche tu hai esperienza di questo, puoi farlo?

L'abbiamo fatto qualche volta, ma più che altro,così, per avere la conoscenza , se no è più comodo e veloce preparare il formaggio con il caglio liquido delle bottiglie anche perché è più buono da mangiare.

Quali attrezzature / tecnologia si usa per la trasformazione del latte per la produzione di altri prodotti?

Gli strumenti sono molto semplici, diciamo.

Questo si chiama “piliscia” perché serve per “pilisciare”, vuol dire rompere la cagliata.

Questo,che a noi adesso ci si è rotto, si mette qua e ha questo compito, vedi?

Il latte quando è cagliato diventa una pasta e si mette lì con il peso sopra e gli si dà la forma e poi andrà in salamoia.

Questo invece si usa per fare la ricotta. Ha questa forma così, a mezza luna circa, perché deve andare a toccare il fondo del contenitore in modo che non si attacchi, questo è utile per fare la ricotta. Quello praticamente è per tagliare la cagliata e questo è per fare la ricotta; è per non fargli prendere odore di fumo,si dice "d'affumada", però sarebbe praticamente il discorso che, attaccandosi, il caldo lo brucia.

Chi è coinvolto nel lavoro dei processi?

Io e miei due figli. Due figli lavorano con me in campagna e ci dividiamo il lavoro quotidianamente, è così. La mungitura la facciamo insieme perché bisogna sbrigarsi per avere il latte, poi ognuno si dedica a fare la trasformazione.. Tutti quanti dobbiamo,chi lavora in compagnia deve sapere fare tutte e tre le cose, sia la mungitura, sia la trasformazione, sia la gestione perché un giorno che uno è impegnato in un'altra cosa, insomma, tutti e tre i ragazzi sanno fare il lavoro e la trasformazione.

Che tipo di lavoro compete alla donna nell'azienda agricola?

La donna, mia moglie, è importante perché ci aiuta nelle cose utili che ci servono a noi quotidianamente sia per la pulizia delle cose, sia per la ricerca di un cliente anche, dopo, perché dobbiamo vendere se abbiamo trasformato per un mese del formaggio o della ricotta per la commercializzazione. Eh, la donna in famiglia è importante.

Ci prepara il pane che noi usiamo qua, il pane tradizionale.

Il maschio si interessa più del lavoro materiale in campagna e la donna ha una parte fondamentale perché tutto quello che noi utilizziamo in campagna, quando arriva in campagna, è stato toccato dalle nostre donne.

In una famiglia la donna è importante.

Ha detto che c'è una divisione del lavoro. Com'è differenziato, il suo e quello dei suoi figli, adesso o durante l'anno?

Beh, in campagna, vedi, bisogna preparare l'erbaio, il pascolo per le capre. Bisogna prepararlo, non è che viene da solo. Bisogna arare i terreni, seminare, raccogliere il fieno, tagliare la legna, pulire il terreno, recintare il terreno e ogni tanto bisogna sistemare la recinzione, la rete. In campagna ce n'è ogni giorno di che lavorare perché ogni giorno c'è il consumo e le deteriorazioni delle cose perché il tempo rovina tutto. A volte si raccolgono le pietre e si pulisce il terreno.

Che uso si fa della pelle di capra?

Mah, adesso noi non la lavoriamo più.

Anticamente -ancora fino mio padre che è mancato da poco - si facevano i contenitori (la bisaccia in pelle) perché il capraro stava fuori anche tutta la giornata oppure due giorni dietro al bestiame, quindi doveva portare le provviste sufficienti anche per tutta la giornata. La sera rientrava all'ovile magari, e l'indomani mattina metteva di nuovo un po' di pane, un po' di formaggio, un pezzo di lardo e partiva dietro al bestiame.

Anche la scarpe facevano con la pelle di capra, anticamente.

Oggi invece siamo più velocizzati e acquistiamo un paio un scarpe senza sapere da dove viene la pelle,probabilmente.

La capra Sarda ha una pelle abbastanza solida, buona perché non è una pelle sottile.

Vede, le capre di altre razze sono tutte molto più delicate, avranno, hanno meno pelo quindi la pelle non è forte, non è solida come la capra Sarda che è protetta da un pelo più folto e resistente. Solo che qua, adesso, la trasformazione diretta non si usa più, non avviene.

Se sì, che tipo di mezzi e strumenti si fanno di pelle di capra?

Si vende la pelle al pellaio, un negozio che ritira la pelle e loro commercializzano, vendono.Verrà trasformata altrove. Non avviene più la trasformazione "in loco",ecco, diciamo. Ma la pelle si vende, si; la vendiamo quando macelliamo qualche capretto o qualche capra. Si mantiene, si fa asciugare e si vende.

Non ci sono piccole industrie di questo tipo in questa zona?

No no, non ce n'è in zona lavoro di trasformazione della pelle. La conceria c'era a Ghilarza esattamente, non ce n'è qua in zona.

Mentre ci sono degli artigiani che quando ritorna la pelle già lavorata in conceria - nel nostro paese a Dorgali ci sono diversi artigiani - fanno le bisacce. Ci sono dei calzolai che fanno le scarpe, che fanno le cinture, che fanno anche dei vestiti,sinceramente. Oggi si fa di tutto con la pelle.

Si utilizza il pelo di capra?

Anticamente si usava molto anche quello. Si radevano, si tosavano, alcune capre che avevano il pelo più folto per fare "sa Bertula" che è un contenitore, una bisaccia, che aveva una forma particolare.

Io adesso gliela potrei descrivere o disegnare ma era un contenitore doppio che andava per metterlo nel pasto dell'asino o del cavallo. Larga quanto per farci entrare la sacca del pane oppure per metterci dei capretti, era voluminosa. Ed era resistente perché si tesseva in un modo particolare. Il filo della capra è più forte della lana della pecora perché, a differenza della pecora, la capra ha il pelo, la pecora ha la lana. Sono due cose diverse.

Si produce "Cashmere" nella vostra zona?

No,no,no.

Quali altri sottoprodotti si producono dalle capre?

Eh, abbiamo già elencato tutto, il capretto, quelle cose li... Per bene che vada oggi si può vendere un po' di letame, ecco. Lo scarto, il letame. Ci sono degli amici che hanno dei giardini e quindi anziché acquistare il sacco confezionato del negozio, dei prodotti di scarti che non si sa bene da dove vengono molte volte,ci sono degli amici, che ci chiedono "mi prepari due sacchetti di concime naturale?", ecco. Vendiamo anche questo. É un sistema per recuperare due soldini. Ma non è una cosa basilare, ecco.

Quali sono i prodotti più importanti o di maggiore reddito?

Il capretto, il latte. I due prodotti più importanti sono il capretto e il latte.

Prima il capretto poi una volta ammazzato il capretto, quel latte che andava succhiato dal capretto,viene munto dal pastore. Quindi abbiamo un secondo guadagno. Prima guadagniamo con il capretto e poi il seguente con la lattazione.

La carne di capre è buona da mangiare?

La carne di capre è ottima da mangiare. Sì sì,tre cose,ma cessa di esistere la capra.

C'è differenza tra la carne di capra e quella di pecora?

Sì è un sapore diverso perché essendo diversa l'alimentazione ha un sapore diverso la carne.

La capra mangia oltre l'erba,gli arbusti o le frasche. La pecora, invece, si alimenta al 90% solo di erba e meno arbusti. Il sapore è molto diverso, più gustoso e profumato.

C. ETNICO MEDICINA VETERINARIA

Descriva alcune esperienze che avete avuto con le malattie degli animali nella vostra vita di lavoro.

Oggi siamo nel 2012, ma già da quaranta o cinquant'anni anche, sono state debellate le malattie gravi della capra.

Quando era giovane mio padre ci raccontavano fino a tarda età, loro ci raccontavano, le storie.

Si tratta di malattie che oggi sono state debellate e che io non ho mai conosciuto.

Oggi una capra può morire anche per una gastrite, può morire per un eccesso di alimentazione ma non muoiono più per epidemie.

Queste epidemie sono state debellate dai vaccini e si tratta dell' " Afta Epizootica" o del "Carbonchio", che erano malattie pericolose fino agli anni '50,ecco. Queste malattie addirittura sterminavano certi greggi. Non era mortale per l'uomo quella carne,infatti la consumavano. Però c'era un particolare: se quell'uomo aveva una piccola ferita, mettiamo nella mano,un pastore, quell'uomo, che stava toccando quella carne cruda aveva una ferita, si contagiava. Purtroppo ne sono morti. Era una malattia gravissima il "Carbonchio" . A carne cotta invece non succedeva niente, la mangiavano e duravano ed era buona la carne. Da noi si faceva così e la mangiavano.

Quali malattie si verificano ogni anno nella zona?

Epidemie non ce ne sono perché si fanno vaccini e si fanno delle cure prima che queste malattie arrivino. Quindi non c'è più la moria di capre, non ce n'è più.

Si può dire che muoiono di vecchiaia o la capra muore quando non è buona come lattazione per via coltello.

Che tipo di problemi possono presentarsi?

Mah, sono due. Può essere la diarrea o un'altra gastrite, ma se no fanno delle "sverminazioni", si dice, per gli antiparassitari che possono contenere..ci sono le medicine che noi conosciamo..Si vaccinano una massimo due volte all'anno e coprono tutto l'arco dell'anno, ecco.

La capra è un'animale anche forte, si difende bene.

Cosa significa se la forma della mammella sembra anormale? Quali esperienze avete avuto?

Si, ma siccome noi mungiamo ancora in forma manuale, la difficoltà è solo nel tempo che puoi impiegare.

Se la capra ha un mammella morbida con una conformazione o con una forma regolare, per la mungitura ci impiegherà due minuti, se invece ha una conformazione più difficoltosa impiegherà tre minuti ma non è una cosa impossibile da fare,ecco.

Si cerca di selezionare la figlia della capra -le caprette da allevare per la rimonta- si cerca di allevarle da quelle capre che hanno una mammella geneticamente più morbida anziché dura, così si svolgerà nel minor tempo il lavoro negli anni a seguire.

Usi mungitrici o mungi a mano?

No, manuale.

Chi lo fa?

Tutti noi sappiamo mungere.

Da chi dipende questo lavoro?

La mattina lo facciamo tutti insieme o dipende da quello che si deve fare. Chi è più libero lo fa. É un lavoro che si fa la mattina e la sera, due volte al giorno. La mattina, la prima cosa da fare è mungere le capre.

Quali possono essere le problematiche legate alla mammella della capra?

La mammella, a volte, si può anche ammalare quindi una mastite che può essere provocata anche dal tipo di alimentazione.

Se mangia un'erba velenosa, ci può essere una capra più golosa per natura, che nonostante sia velenosa, cio è acida, un tipo di erba, la mastica lo stesso e allora si rovina il latte. Il latte verrà giallo anziché bianco.

L'altro problema della mammella può essere, a seconda della consistenza delle "venuzze" che contiene l'apparato mammario, si possono spezzare, rompere, dei capillari e quindi quel latte verrà infestato dal sangue e vedremo il latte.

Noi ce ne accorgiamo immediatamente quando inizi a mungere se fuoriesce un po' di latte rosso allora smetti immediatamente di mungere nel latte bianco e terrai quel latte in un altro contenitore per gli animali,per scarto, per i cani, o si butta.

Non si deve trasformare una volta inquinato.

Quali sono le ragioni e il significato della perdita di peso di una capra o di un capretto? Che esperienza avete avuto?

Se un capretto perde peso può essere per qualsiasi cosa come può essere per un cristiano,una persona,un uomo. Perde peso per che cosa? perché mangia poco perché ha inappetenza. Se perde peso è un sintomo che sta sopravvenendo qualche disturbo, qualche malattia. Il calo del peso è legato all'alimentazione, non lo sappiamo? chi mangia molto ingrassa chi mangia di meno dimagrisce.

Avete avuto esperienze di un capretto o di una capra che ha perso peso?

Eh, sì quando vediamo qualcuno che si sta assottigliando diciamo "questo capretto ha qualche disturbo". Vuole dire che può avere pascolato dell'erba infestante oppure che, noi non lo sappiamo, ma il latte della mamma può essere ammalato da qualche problema di avere pascolato erbe (infestate) . La madre,in quel caso quindi, al figlio, al capretto sta dando del latte infestato. Se gli da del latte infestato non lo nutre bene e quel capretto va ad ammalarsi e quindi ad assottigliarsi.

Si può curare in quell'attimo, se ce ne accorgiamo immediatamente, subito, si vede. Allora ci sono delle medicine. Si fa una siringa di un antiparassitario se si trattasse di vermi o qualcosa per curare lo stomaco di questo animale che si sta nutrendo male.

Qual è il significato se la forma degli occhi sono dissimili? Quali esperienze avete avuto?

Niente, noi non gli diamo peso né al colore, né alla forma degli occhi.

Però quando arriva a segnalarlo nell'occhio il lavoro da fare è fatto. Quando perde consistenza l'occhio vuol dire che già sta per finire, che è molto malata, allora la cosa è grave.

Qual è il significato di scarichi dal naso e gli occhi di una capra?

Nel naso quando fa molto freddo. L'erba in un erbaio è bagnata di rugiada, a volte di rugiada, a volte di brina con il ghiaccio. Infatti è meglio, è preferibile, quando c'è una mattina fredda, liberare le capre dal recinto verso le undici, anche mezzo giorno perché la capra è veloce nell'alimentazione, pascola in fretta, due o tre ore.

Tre, quattro ore sono già sufficienti per la sua alimentazione. Quando il pascolo a quell'ora è già caldo, raramente vedremo della mucosa dal naso.

Se invece le liberiamo la mattina presto alle sette o alle otto e quell'erba è ghiacciata nel giro di pochi giorni daranno quei sintomi attraverso il naso.

Quali esperienze avete avuto?

Eh, purtroppo le abbiamo avute perché non sempre c'è la possibilità di rimanere per forza. Uno, alle undici, se deve andare in un altro posto per svolgere un altro lavoro, si liberano, e però non è proprio corretto,diciamo cosi. A volte può provocare queste malattie. É un rischio. L'erba fredda può generare questi sintomi dal naso e le abbiamo avute nell'arco di anni, avendo svolto per decenni questo lavoro quindi io, può immaginare, è da quarantadue anni che faccio il pastore quindi in quarantadue anni ne abbiamo visto parecchie di capre e pecore con la mucosa del naso ed è una cose relativamente semplice, nell'arco di qualche giorno sparisce. Se no, purtroppo si aggrava e può morire.

Avete alcune piante mediche in questo settore?

Si.

Conosce quelle piante?

Le piante, noi usiamo il "Crammediu", probabilmente in italiano non lo so se si chiama "Calmedio" o come verrà chiamato.

É una pianta che viene distillata. Si fa bollire, si mette questo estratto in una bottiglia e verrà usato per le ferite se distillato al massimo. Più concentrato è, serve per le ferite se la capre cade, si facesse un taglio o qualche ferita, è cicatrizzante.

Lasciato un po' più liquido è utile per i germi e quindi si metterà per via orale, internamente, ecco.

Altrimenti si usa anche un po' di acquavite, una grappa forte.

La prima grappa, quando si fa, si usava per "sverminare". Nello scarto delle capre fa delle "tenie" che aggrediscono l'intestino, vero? Allora quelle "tenie" vengono espulse quando si dà questo. Un po' di acquavite (basta un po' oggi un po' domani, due o tre giorni un mezzo bicchiere di acquavite) espelle quelle "tenie", pulisce l'intestino.

E queste sono le cose che usiamo localmente ecco, senza ricorrere alla farmacia, con queste erbe e con questa acquavite.

Usi le piante medicinali per la malattia delle capre? Usi piante particolari per curare le malattie?

No, sono medicine semplici, ci dicevano i nostri nonni.

Oggi, grazie a Dio, si ricorre al veterinario, si usa una medicina che è segnalata da un esperto, ecco.

Oggi raramente si cura con delle erbe fatte da noi perché uno scrupolo dice magari se aspetti una settimana curandolo con il "Crammediu" con l'acquavite rischi di far morire il tuo bestiame. Si velocizza con l'intervento del veterinario.

Avete alcune esperienze, durante questi quaranta anni, di guarigioni di capre utilizzando piante mediche particolari per curare malattie?

Sì,sì, queste erbe che stiamo dicendo erano sufficienti per bloccare (la malattia). Oggi però per velocizzare non le usiamo più. Se no, erano abbastanza (sufficienti). Non le inventavano, le avevano provate. Si era reso conto che effettivamente rendeva, le difendeva, faceva, espellere le "tenie" oppure cicatrizzare una ferita, come ho detto.

D. LOTTA ALLA POVERTÀ

Quali sono i vantaggi dell'allevamento dei caprini per voi e la vostra famiglia?Non si tratta solo di vantaggi economici, no?

Bravo, è cosi. Noi usiamo, abbiamo impiantato le capre, da un po' di anni e i nostri nonni lo facevano innanzitutto per sopravvivere, perché allora la capra era importante più delle pecore perché i terreni non erano coltivati come sono coltivati oggi.

Immaginiamo quando la Barbagia era solo bosco e quindi la capra ci andava, la pecora non avrebbe potuto vivere.

Adesso invece che terreni che sono coltivati, c'è ancora la montagna che dà alimentazione,ma c'è anche un terzo motivo che questi anni ci sta dando soddisfazione, diciamo così. Stiamo cercando di migliorarci anche con i ragazzi. Abbiamo un progetto che sta avanzando piano piano, da un mese all'altro sappiamo qualcosa di buono.

Dobbiamo creare, stiamo creando, una fattoria didattica quindi anche la capra è importante perché i caprari sono diminuiti. Sono, siamo remasti in pochi, ad allevare la capra.

Ci sono più allevatori di mucche e di pecore che non allevatori di capre.

Le nuove generazioni, cioè i ragazzini delle scuole dall'asilo alle elementari alle scuole superiori vengono a visitare l'ovile per conoscere tutti gli animali possibili che vivono, insomma, nella nostra zona.

Quindi la capre ha un senso anche da quel punto di vista per noi, ecco. Per la nostra famiglia c'è il ritorno economico del capretto, del latte, della carne di capra e piano piano stiamo lavorando per entrare anche nel giro di questo.

Sarà un altro ritorno, speriamo,economico.

Come fa l'allevamento delle capre a dare lavoro ad altri membri della comunità?

Ecco, questo ragazzo che adesso sta lavorando per conto nostro noi lo paghiamo perché certi lavori vanno fatti il più veloce possibile perché noi siamo molto legati ancora al fatto meteorologico,al tempo. Non abbiamo una struttura diciamo di irrigazione, cose del genere, ancora.

Quindi bisogna insegnati al fattore tempo.

Il terreno adesso va bene per la natura perché ha piovuto in autunno a sufficienza e si può arare. Se trascuriamo, aspettiamo ad arare mezzo ettaro al giorno sia allunga il tempo, il terreno diventa più arido e lavoreremo male.

Invece bisogna concentrare in una settimana, 10 giorni, 20 giorni , svolgere quei dati lavori che vanno svolti in quel tempo. Ecco, velocizzare.

Quindi noi diamo lavoro anche a terzi. Un ragazzo che è capace, ha un mezzo idoneo sufficiente certe per questo. Ma per noi è importante svolgerlo nel più breve tempo possibile.

Quali influenze hanno le capre per la produzione di foraggio, pascoli, foreste?

La capra, per la produzione del foraggio deve stare da una parte, perché sennò, se pascola il foraggio non avrà il foraggio; se pascola l'erbaio non avrà il foraggio.

Quindi lo pascoliamo fino a Febbraio poi le capre fuori e avviene la produzione del foraggio. La capra deve stare fuori e andrà nella foresta, mangerà tutto quello che c'è nel bosco, non è che mangia tutte le piante, perché le piante le sceglie. La capra è un animale che sceglie i germogli. Abbiamo visto come si sollevano per scegliere dei germogli che sente più particolari.

La Barbagia, la nostra zona qua, è ricca di vegetazione di Leccio per esempio. Produce le ghiande la pianta, la Quercia.

Ci sono delle piante che producono delle ghiande dolci e alcune ghiande meno dolci.

Le capre ci insegnano qual'è la pianta dolce e qual'è la pianta meno dolce.

Se noi abbiamo davanti all'ovile 20 Querce e osserviamo le capre quando le liberiamo dal recinto,corrono; le abbiamo viste correre per entrare nel bosco. Se noi andiamo ad assaggiare le ghiande della prima pianta dove vanno le capre, ci accorgeremo che quelle pianta ha una ghianda dolce. Lei magari, la capra, supera le prime tre piante e va alla quarta. Ci insegna qual'è la ghianda dolce e la ghianda meno dolce.

La capre è furba, intelligente, insomma le piace la roba buona come all'uomo.

La fertilità del bosco e delle foreste è importante?

Mah, qua il terreno è abbastanza fertile. Qua non siamo in un altopiano di “Basalto” per esempio, la nostra zona, che Gian Carlo Carta conosce molto bene da esperto nel settore, ci potrebbe spiegare molto bene come la conformazione naturale del terreno di Lanaitto, essendo il terreno di trasporto,è un terreno fondo, è terra molto fonda.

É un ex-letto di un fiume. Il calcare, nei secoli, nei millenni, ha prodotto e ha formato questa valle e quindi troviamo degli strati di terra ottimi per la costituzione del pascolo sufficiente per la capra.

Quindi il terreno pianeggiante che vediamo ha ,sì, delle pietre rotolanti - è un terreno di trasporto - ma il bosco è ricco dell'humus delle piante, della legna che marcisce,delle foglie. Questo terreno

è buonissimo per far nascere l'erba sviluppo a differenza del terreno di basalto di un altopiano che ha un strato di terra molto sottile quindi l'erba cresce in forma ridotta. In un altopiano raramente troviamo boschi di "Leccio". Troviamo un po' di "Olivastro", troviamo un po' di "Lentischio". Invece qua, grazie a Dio, il terreno calcareo offre molto, molto di più perché è formato in un altro modo.

Che tipo di attività aziendale preferisci fare da solo? Perché?

Il lavoro del capraio si può fare anche da solo e tanti, ha citato poco fa Gian Carlo Carta una persona che lavorava da solo con le capre in montagna. Si può fare anche da solo, ma ci si stanca a seconda del numero del gregge.

Tu cosa preferisci fare, o che cosa preferisci che faccia tuo figlio?

Preferisco lavorare insieme intanto perché insegni e fai più cose. Puoi aumentare la produzione.

Per esempio tu hai preferenza nel fare il formaggio, nel mungere o in che cosa?

No, no non è che preferisco. Si devono saper fare tutte e tre le cose, sia la conduzione delle capre, sia la mungitura, e sia la trasformazione, tutto fa parte del tuo lavoro

É come che un fabbro sappia fare solo pale e poi non ti sappia fare una ringhiera o come un falegname che può fare un tavolo ma non sa fare una finestra!

Quali aspetti della vostra attività nell'azienda sono speciali o unici che altri non possono fare come te? Perché e come è diversa dagli altri?

La fortuna di uno che ha un terreno vasto e confinante con il terreno comunale con la montagna è che le capre hanno di tutto nel nostro terreno, trovano tutto quel tipo di alimentazione cioè erba in quella stagione utile per l'erba, poi in primavera e in estate trovano la montagna, il bosco, quindi questa è una buona possibilità per noi.

Le nostra capre trovano di tutto. Un altro capraro che ha delle opportunità ridotte cosa fa? Deve fare la transumanza ecco, spostarsi,perché ha un buon terreno di erba in autunno e poi d'estate le deve portare nella montagna perché avrà bisogno della montagna, quando le deve spostare.

Noi abbiamo la fortuna di avere un terreno con pastura sufficiente nello stesso posto, stare stazionario.

C'è un'attività che tu fai o che gli altri non possono fare come te, che per te è speciale e unica, magari imparata da tuo nonno o da tuo padre che in questa zona è particolare?

No, il lavoro, guarda, uno che lo fa a Dorgali, un capraro che lo fa ad Orosei è sempre quello. Non è che la capra di Alghero ha due mammelle, quattro mammelle, o sei mammelle.. dipende dal pascolo.

Nella capra, tutto è legato all'alimentazione e l'uomo deve sfruttare o sviluppare la trasformazione. Non è che mio nonno mi insegnato una cosa, mio padre mi ha insegnato una cosa e ad un altro capraro hanno insegnato altre cose; sempre si riduce a quelle due, tre cose; conduzione e trasformazione.

Noi non è che siamo più bravi di quelli di Orgosolo o meno bravi di Orgosolo di capraio, no.

Lo chiedo perché da noi è diverso. Una persona si vanta, per esempio, del fatto che quando fa il formaggio, da 10 litri ne fa un chilo e mezzo,due chili. Altri ne fanno un chilo.

No, ma quello non è un merito del pastore quello non è un merito mio. Per fare un chilo di formaggio di capra ci vogliono 6 litri di latte in media. Qui. Se andiamo in un altopiano oppure a Orosei o in una pianura dove si produce solo erba e non c'è bosco, ci vorranno 7 litri di latte. Quello non è merito del pastore, è merito dell'alimentazione che hanno.A seconda del latte, se latte avrà meno grassi e più caseina o viceversa. Quindi non è il pastore che entra in merito a quello.

Stiamo parlando di capra Sarda, se parliamo di altre capre..No, no non ci interessa..

Ha esperienza di qualche raccomandazione, strumento o metodo date da suo padre, suo nonno che utilizza ancora lavorando con le capre?

Una cosa particolare ,per esempio, è svezzare il capretto.

Il capretto che si deve allevare per la monta, per la rigenerazione del gregge, quando li devi separare della madre per liberarli dopo perché vadano dietro il gregge bisogna fare "Su cammu".

Si tratta di un pezzo di legno che si mette in bocca, si mette sopra la lingua legato alle corna o comunque al collo dietro le orecchie. Questo bastone di legno sopra la lingua, nella bocca del capretto, permetterà al capretto di pascolare e di mangiare ma non gli permetterà di succhiare il latte perché ha questo bastone sopra la lingua non potrà succhiare. Queste sono raccomandazioni che ci hanno detto basilari perché è una forma di svezzamento sicuro. E questo dovrà andare avanti per un paio di mesi dovrà anche tenere questo...e questo, vede, si chiama " Su Cammu" che si mette sulla lingua.. qua.. su queste scanalature ci va legato un filo di lana, non un filo plastica perché la plastica taglierebbe, invece si fa in la lana.

Questo, ecco questa è una cosa particolare, "Su Cammu" perché viene preparato con una sagoma particolare, vede, è più grosso al centro..

(Questo chi l'ha fatto? Questo l'ha fatto Bobore Casu. Bobore l'ha fatto? Si.

Quale Bobore? Il Capraio di Lanaitto.)

Ha altre esperienze come questa?

Solo questo, ma il mio lavoro è umile, semplice che può fare non dico chiunque, se uno dice "mi metto a fare il capraro" e non sai quelle 5 – 6 nozioni importanti pasticci, ecco.

Invece bisogna avere l'umiltà di farlo nel modo più corretto possibile, sia la sistemazione dell'ovile perché è importante, come abbiamo già detto, se loro consumano una balla di fieno per mangiare è meglio metterne due nel periodo invernale perché il caldo è molto importante sia per le capre adulte o ancora di più per i capretti giovani..il caldo e la salute per il bestiame non

devono avere umido dove si coricano perché, se no, si prendono malattia nel quello, farlo seriamente importante non è che uno può improvvisarsi, così, a farlo da l'oggi al domani.

Tutto è fattibile e tutto possiamo imparare, però le raccomandazioni che ci hanno dato e tramandato i nostri genitori, nonni o i nostri avi cerchiamo di raccomandarle anche ai ragazzi..”ragazzi, fate in questo modo perché è utile..” poi ognuno cerca di sviare e farà anche più velocemente. okky.

Ma certe raccomandazioni a distanza noi ci accorgiamo che hanno ragione se ce le hanno date. Tutti i lavori hanno i loro piccoli segreti, però nel bestiame è importante.

Lei conosce ogni capretto, sa riconoscere quale sono i figli dei vari capretti?

Si,si, si riconosce questo o quel capretto.

Capisce anche quanti anni hanno le capre o quanti mesi ha un capretto?

si, si. Esatto.

Senza la documentazione?

No, no.

Se non ricordo male la capra allatta solamente il proprio capretto e se è un altro non lo allatta.

Se tu prendi un capretto da quel piccolo recinto dove vengono messi quando è d'inverno e tu lo appoggi davanti a una capra qualsiasi, il capretto non succhia da quella capra e quella capra non lo vuole. Lui andrà a cercare nel recinto fino a trovare la sua madre appropriata, ma noi la conosciamo e lo avviciniamo immediatamente

Quella va con esperienza. Si, con gli anni uno acquista esperienza e si riconoscono.

Se muore un capretto il latte di madre poi lo mungi?

Se muore il capretto si munge la capra. L'importante è che il latte viene tolto dalla mammella, si munge mattina e sera. La capra se muore il capretto deve essere subito munta,se no, va in secca, si rovino

Il latte esce lo stesso?

Si, si da subito, hanno il latte e lo munge l'uomo, la mano umana.

L'importante è quando partorisce la capra è per quattro giorni il latte è diverso.

Sappiamo che i mammiferi hanno quel latte colostro che ha un nutrimento immunitario più sicuro ed è più utile per l'avviamento dell'animale, del capretto che succhia quel latte particolare, è una protezione.

Dopo quattro giorni il latte cessa di essere colostro e diventerà bianco, lucido e utile per la trasformazione o per l'alimentazione e avrà altre proprietà ma il capretto durante quei quattro, cinque giorni è già forte per andare avanti.

Dopo quanti giorni può mangiare erba il capretto?

Il capretto tarda più dell'agnello a mangiare l'erba perché è diversa geograficamente la via dove dovrebbe andare a vivere il capretto.

L'agnello va subito dietro la madre al pascolo dal giorno stesso, invece per il capretto è sufficiente il latte, aspetta di più, ecco, addirittura dopo due mesi,ecco.

Per due mesi al capretto gli è sufficiente solo il latte, è autonomo con il latte.Andrà a mangiare avendo una costituzione dentaria più forte già dal terzo mese circa.

BREEDER B

Mr. Natalino Fadda Interview

Isoe, Orosei, Nuoro, Sardinia, Italy - 28.11.2012

Accompagnato dal signor Giancarlo Carta

A. AGRICOLTURA E USO DELLA TERRA

Ha costituito lei la mandria?

Si, questa è un'azienda antica, ma da quando l'ho presa in mano ho dovuto ricostruire tutto da zero.

Ha significativamente modificato il sistema di allevamento rispetto a chi è venuto prima di lei?

Certo. Qui rispetto ai metodi antichi abbiamo cambiato tutto. Prima l'azienda era costituita solo da un piccolo recinto. Oggi abbiamo attrezzature, locali coperti. Tutto questo prima non c'era.

In quale zone preferiscono pascolare le sue capre?

In genere preferiscono dove ci sono piante da arbusti.

In che misura queste zone sono coltivate?

Abbiamo anche aree coltivate. Per esempio questa dove ci troviamo è da coltivare; sono circa due ettari.

In che misura sono invece aree boschive, di cespugli e prati naturali?

La maggior parte, forse il 90%, dei nostri terreni sono costituiti da bosco, cespugli, arbusti, e anche alberi d'alto fusto. In due parole macchia mediterranea.

Che tipo di foraggio utilizza? Che tipo di mangime utilizza per le sue capre?

Principalmente usiamo l'erba medica. Col mangime preferiamo variare: cereali di vari tipi, legumi, mangime concentrato. Preferibilmente cereali, fave, piselli, mais.

Utilizza qualche tipo di associazione di colture (ad esempio leguminose più graminacee, . . .)? A che tipo di sistema di rotazione fa ricorso

(fraintende la domanda) Leguminose? Talvolta diamo fave, piselli, Mais. Ma principalmente le capre stanno al pascolo brado. Ne abbiamo molti ettari.

In che stagione affronta la scarsità di cibo per gli animali?

Sicuramente la fine dell'estate. A volte la siccità si protrae fino all'autunno. Dipende dalle condizioni meteorologiche: il motivo è sepre quello.

In genere, fa ricorso ad integrazioni supplementari?

Si, per tutta l'estate e l'autunno quando il pascolo scarseggia, integriamo con il foraggio. Invece quando il pascolo è abbondante diamo solo una integrazione di cereali e mangime concentrato.

B. ALLEVAMENTO DI ANIMALI

A quale razze appartengono le sue capre?

Sono tutte di razza Sarda.

Lascia il bestiame al pascolo tutto l'anno? Altrimenti, in che stagione le capre rimangono in ovile?

Normalmente le capre stanno sempre all'aperto, anche di notte. Trascorrono la notte nell'ovile solo quando hanno i capretti.

Di che genere di attenzioni e precauzioni necessitano le capre all'interno dell'ovile?

Semplicemente il cibo e una lettiera pulita. Il pericolo principale, quando ci sono i capretti, è costituito dai predatori. Dobbiamo controllare spesso le recinzioni, perchè le volpi, se riescono ad entrare, possono fare una strage. E ci sono anche le martore e le donnole.

Che tipo di gestione utilizza nella sua azienda?

Gestione familiare. Faccio tutto io, a mano. Per mungere uso le catture e le mangiatoie, quelle che vi ho mostrato.

Quante volte all'anno si riproducono le capre?

Normalmente le capre hanno non più di una gravidanza all'anno.

Utilizza l'incrocio per la selezione del bestiame?

Si. Scegliamo i capi che vogliamo fare accoppiare.

Fa ricorso all'inseminazione naturale o artificiale?

Preferiamo quella naturale.

Che caratteristiche deve avere un buon ariete per garantire la riproduzione?

Un buon maschio da riproduzione dev'essere innanzitutto ben formato e sano.

Quali sono le caratteristiche di un ariete ben formato?

L'altezza innanzitutto: dev'essere un esemplare possente. E poi la forma del capo, e un corpo generalmente proporzionato.

Ha un ariete ben formato nel suo gregge?

Più d'uno! Purtroppo non sono qui, altrimenti ve li avrei mostrati. Ora sono al pascolo insieme alle capre.

Che caratteristiche deve avere la pecora per garantire buona resa e un' elevata fertilità?

Anche la capra dev'essere ben proporzionata, e adatta all'ambiente. Ad esempio, la mammella dev'essere tondeggiante e non troppo grande, altrimenti può essere danneggiata dagli arbusti, specie quelli spinosi.

Per quante capre utilizza un ariete per inseminazione naturale?

Ogni ariete può riuscire ad accoppiarsi anche con 30, massimo 40 capre.

In che modo riconosce il periodo migliore per l'inseminazione?

In base alla mia esperienza, il periodo migliore è fra i mesi di Giugno e Luglio.

Quali sono i sintomi del calore che presentano le capre?

Un primo sintomo è che le capre starnutiscono. Inoltre mimano l'atto dell'accoppiamento, saltando una addosso all'altra. E la vagina appare un po' arrossata.

Come capisce che sta per iniziare il periodo fertile?

Sono i maschi a dare i primi segnali dell' inizio del periodo fertile. Cominciano ad agitarsi 10 giorni prima delle femmine.

Che tipo di inseminazione (naturale o artificiale) è più semplice, conveniente ed economica?

E' più conveniente l'inseminazione naturale.

Quale preferisce?

Preferiamo l'inseminazione naturale. Oltre ad essere più economica è anche più sicura.

Come si fa a sapere quando un capretto nascerà?

E' sufficiente contare i mesi da quando è stata inseminata, dall'accopiamento.

Quali sono i sintomi della nascita del capretto?

Basta guardare la capra per capirlo, dalla forma della pancia. E la mammella si gonfia.

E' possibile che una capra partorisca gemelli?

Certo. Può partorire anche 3 o quattro gemelli.

Se una capra partorisce gemelli, come fate a saperlo prima?

Lo sappiamo perchè si vede. Dalle dimensioni della pancia si capisce che i capretti sono più di uno.

Quali altri prodotti fornisce la capra, oltre ai capretti?

Oltre ai capretti, la capra produce il latte. Nient'altro.

Quanto latte in media una capra produce in un giorno?

Ne produce fra 1 e 2 litri al giorno- 1 litro, 2 litri. Quando alimenta il capretto non possiamo saperlo con certezza, ma quando siamo noi a mungerla la produzione è fra 1,5 e 2 litri al giorno. Dipende principalmente dall'alimentazione, ma anche dal tempo.

Usi mungitrici o mungi a mano?

Qui facciamo tutto a mano: mungitura manuale.

Come impiegate il latte delle capre? Quali prodotti ottenete dal latte?

Normalmente lo vendiamo ad un caseificio. Lì lo impiegano per produrre il formaggio.

Solo il formaggio o anche altri prodotti?

Noi, oltre al formaggio, facciamo anche la merca, e la ricotta.

Che tipo di materiale si usa per la fermentazione?

Noi usiamo il caglio naturale. Si compra già pronto ed è molto pratico.

Avete anche provato a ricavarlo dallo stomaco del capretto o dell'agnello?

Sappiamo che ancora oggi ci sono persone che il formaggio lo fanno così, ma noi preferiamo di no. Quello è un procedimento delicato: richiede molta attenzione.

E in passato?

In passato si faceva solo così, con lo stomaco dell'agnello o del capretto. Io stesso l'ho visto fare e saprei farlo ma, ripeto, preferisco usare il caglio pronto.

Quali attrezzature / tecnologia si usa per la trasformazione del latte per la produzione di altri prodotti?

Occorre un recipiente apposito, un fornello di dimensioni adeguate, un mestolo lungo per rimescolare il prodotto durante la lavorazione, e le forme destinate a contenere il formaggio. Posso mostrarle tutta questa attrezzatura.

Chi è coinvolto nel lavoro dei processi?

In genere faccio tutto da solo. Occasionalmente mi possono dare una mano mio fratello o mio padre, ma in genere lavoro da solo.

Che tipo di lavoro compete alla donna nell' azienda agricola?

L'unica donna in azienda sarebbe mia moglie. Un tempo mi aiutava anche per la mungitura, ma adesso non più. Ora da una mano a condurre il gregge.

Che uso si fa della pelle di capra?

Le pelli di capra possono essere lavorate, per ricavare borse, astucci o altro, ma noi non ne facciamo e in questa zona non esistono artigiani che facciano questo lavoro.

Per fare quali tipi di strumenti si usa la pelle di capra?

Non saprei. Noi le pelli di capra le vendiamo e basta.

Si produce cashmere nella vostra zona?

Non ne ho mai sentito parlare.

Quali altri sottoprodotti si producono dalle capre?

Come ho detto prima, dalle capre ricaviamo solo il latte e la carne, dei capretti e della capra stessa

Quali sono i prodotti piu' importanti o di maggiore reddito?

La maggior fonte di reddito sono certamente i capretti e il latte.

C. ETNICO MEDICINA VETERINARIA

Che esperienze avete avuto con malattie degli animali nella vostra vita di lavoro?

Abbiamo avuto a che fare con diverse malattie. La più temuta è l'aborto della capra.

Quali malattie si verificano ogni anno nella zona? Che cosa fate per contrastarle?

Per l'aborto di cui parlavo non c'è niente da fare.

Non fate il vaccino?

Non esistono vaccini efficaci. E' una malattia che passa da sola, naturalmente: l'animale colpito dopo un po' si immunizza da sola.

Per questa patologia il vaccino non serve a niente.

Può descrivere questa malattia e i suoi sintomi?

Il sintomo è molto evidente. Si manifesta quando la capra è gravida da un mese. Abortisce il feto e si può vedere chiaramente il sangue sotto la coda.

Che cose fare per prevenire questa malattia?

Non conosciamo alcun metodo di prevenzione per l'aborto precoce della capra .

Qual è il significato se la forma della mammella sembra anormale? Quali esperienze avete avuto?

(All'intervistato vengono sottoposte alcune fotografie)

Vediamo. Questa potrebbe essere una mastite: la mammella è gonfia ma la capra non sembra gravida.

Quando una forma delle mammelle è dissimile o anormale lei cosa pensa che sia successo, che malattia è? Voi ne avete avuto esperienza?

Può essere la mastite. Per questa esistono dei vaccini, ma la mastite dipende anche dall'alimentazione: la capra la contrae se mangia troppi cereali.

E' successo qualche volta nella sua azienda?

Abbiamo avuto diversi casi. Ne conosciamo due varianti: una leggera, che noi chiamiamo "mastite bianca", da cui l'animale può guarire completamente. Se sulla mastite leggera si impianta un'infezione, allora la mammella diventa viola, e noi parliamo di "mastite nera", che può anche uccidere una capra, oppure la priva per sempre del latte.

Se il latte prodotto non è in condizioni normali, qual è il significato o possibili sintomi di malattia? Quali esperienze avete avuto?

Per accertare la qualità del latte usiamo il CMT (California Mastitis Test n. d. r.), anche sul latte che ha un aspetto normale. Se il latte sottoposto al test si addensa in grumi, può esserci una mastite, anche se non si vede, e il latte viene distrutto. La causa può essere l' alimentazione troppo ricca di proteine, oppure puo' essere una febbre.

Quali sono le ragioni e il significato se una capra o un capretto perde peso? / Che esperienza avete avuto?

L'animale può perdere peso a causa dell'alimentazione. Oppure può essere la pasterellosi (infezione da Pasteurellosis Multocida n. d. r.), che da diversi sintomi, spesso accompagnati da febbre.

Non potrebbe essere una parassitosi?

Sicuro. Anche i parassiti possono causare questi sintomi.

Avete esperienza di malattie causate da parassiti? Che cosa avete fatto in questi casi?

Si, abbiamo avuto dei casi di perdita di peso a causa dei parassiti. Anche per questi ci sono dei vaccini, ma ci vogliono molti soldi e talvolta non ci sono .

Qual è il significato se la forma degli occhi sono dissimili? Quali esperienze avete avuto?

Questo puo' essere sempre pasterellosi, anche i parassiti fanno questo: i parassiti polmonari. Quando hanno febbre gli occhi diventano così.

Qual è il significato di scariche dal naso e degli occhi di una capra? Quali esperienze avete avuto?

Anche questi sintomi possono essere causati dai parassiti, dei polmoni e del fegato.

Avete alcune piante medicinali in questo settore?

Non, non facciamo uso di piante medicinali. Io non ne conosco alcuna.

L'unico impiego di piante per curare le capre è l'uso del fusto della ferula (Ferula communis n. d. r) essiccato, come stecca per immobilizzare le fratture delle zampe.

Come ha appreso questa tecnica per curare le fratture?

Tutto quello che faccio l'ho imparato da mio padre. Sempre per esperienze dirette.

Il mestiere del pastore non è insegnato nelle scuole. Si studia iniziando da piccoli ad apprendere le cose dagli anziani.

D. LOTTA ALLA POVERTÀ

Quali sono i vantaggi dell'allevamento dei caprini per voi e la vostra famiglia?

Non parlerei di vantaggi, ma di sopravvivenza. Col nostro lavoro il reddito è molto basso.

A parte l'aspetto economico, quali altri vantaggi comporta l'allevamento di capre per te e per la tua famiglia?

Non ci sono altri vantaggi, è un mestiere normale. Ad allevare capre non si accumula certo ricchezza.

Come fa l'allevamento delle capre a dare lavoro ad altri membri della comunità?

Come ho detto, io lavoro da solo. Il latte lo verso al caseificio. Lì naturalmente ci sono gli addetti alla produzione, dipendenti della Cooperativa.

Lei per mandare avanti l'allevamento ha bisogno di pagare un veterinario?

Non lo pago direttamente, ma in fondo sì, lo paghiamo lo stesso. E poi quando compriamo le medicine diamo lavoro anche al farmacista.

Quale influenza hanno le capre per la Produzione di foraggio? / Pascoli? / Foreste?

Le mie capre pascolano principalmente su terreni incolti, liberi . Non arrechiamo danni alle colture. Certo, anche la flora selvatica può subire danni, ma sono piante molto rersistenti. Fra l'altro, mentre mangiano, concimano il terreno.

Che tipo di attività aziendale preferisce svolgere da solo?

La mungitura è quello che me piace di più, perchè è il momento del giorno in cui raccolgo il frutto del mio lavoro. In effetti però mi piace tutto. Non si può fare un lavoro come questo se non c'è la passione di farlo.

Quali aspetti della vostra attività nell'azienda sono speciali o unici che altri non possono fare come lei? E' in qualche modo diversa dalle altre?

Non credo di fare nulla di speciale. Qui si fanno le cose come in mille altre aziende zootecniche.

Quale esperienza dovrei avere in più degli altri?

Non so. Ci dovrei pensare. Io questo lavoro cerco di farlo al meglio possibile, e in fondo ogniuno fa quello che può. Non dico che non ci siano differenze da un'azienda all'altra. Certamente c'è chi una certa cosa la fa bene e chi meno bene. Ci può essere differenza nell'alimentazione, il tipo di mangime o di pascolo, ma nessuno si allontana molto dalla media.

Ma può indicare una differenza fra il suo lavoro e quello di altre aziende?

Come ho detto, può darsi che io faccia qualcosa di diverso, perfino meglio, ma io la faccio come la so fare. Forse una differenza può essere la mungitura, che gli altri fanno con la mungitrice, mentre io la faccio manuale.

BREEDER C

Mr. Cossu Giovanni Interview

Nuoro, Sardegna, Italy - 04.12.2012

Accompagnato dal signor Giancarlo Carta e dalla Dott ssa. Cythia Vagnetti

A. AGRICOLTURA E USO DELLA TERRA

Ha costituito lei la mandria? Se no, ha significativamente modificato il sistema di allevamento rispetto a chi è venuto prima di lei?

Quando ho iniziato l'attività, qui non c'era niente. C'era solo una capanna - se vuole glie la faccio vedere - che era proprio di quelle arcaiche, dei proto-sardi (scherza. n.d.r.). Abitavamo li, di notte e di giorno, era il mio luogo di lavoro e la mia casa.

La maggior parte della vita l'ho trascorsa qui, da quando avevo 12 anni, quindi 65 anni fa. Con mio padre avevamo pecore, capre e maiali. Più o meno come adesso. Non è che abbiamo cambiato tanto.Si capre, pecore e mucche.

In quale zone preferiscono pascolare le sue capre?

Certamente dove c' e' il bosco. Invece l'erba, nel terreno coltivato, non e' che non la mangiano, però preferiscono avere rami, frasche. Devono avere il duro della pianta, se no non ci vivono (la capre). La pecora è soddisfatta dell'erba, la capra no. Inoltre la capra apprezza l'erba anche quando è secca e indurita, mentre la pecora preferisce brucare l'erba giovane.

Lei ha parlato anche di pascolo coltivato...

Si, ne facciamo un po'. Abbiamo un terreno coltivato a prato-pascolo, non lontano da qui, saranno 5 chilometri. Ne abbiamo un pezzo piccolo anche qui. Ma più che altro ci sono vincoli, che non possiamo neanche arare. Io stesso ho subito forse qundici processi. La Guardia Forestale mi ha fatto ammende anche da 8, 10 milioni di lire (L'euro ha sostituito le lire nel 2002. n.d.r.).

Ma io aravo lo stesso. Sono finito varie volte dal giudice e sono stato sempre assolto. Si vede che quella cui facevano riferimento i Forestali non è una legge nazionale. E non è neanche una legge giusta, se no il giudice almeno una volta avrebbe dovuto condannarmi, invece mi ha sempre assolto. E qualche guardia forestale addirittura si è permessa di dire che i giudici non conoscevano la legge, mentre loro, le Guardie Forestali, la conoscevano, Se non ci lasciavano lavorare, io li mandavo anche al diavolo. Non ero molto tenero con loro.

Che significato ha questa legge? Quanto è stata emanata?

Queste leggi saranno cominciate circa 20 o 25 anni fa. Sono leggi regionali, non leggi dello stato Italiano. Sono leggi che si fanno loro. Addirittura uno che era figlio di un grande industriale del sughero si era permesso di fare questa leggiucola per cui non si poteva arare un terreno se c'erano delle querce da sughero. Poi l'hanno abolita. Tutto il paese di Bitti si era ribellato. C'era chi aveva avuto multe per 100 milioni, anche 200 milioni di multa. Per loro (I politici delle Regione) i milioni sono ciliegine! Milioni di lire. Naturalmente parlo di lire e non di Euro.

Questa legge l'hanno abolita circa 10 anni fa. Ora però ne hanno fatto una ancora più bella. Dove passa il fuoco, per 10 anni non si deve più pascolare, nè costruire, nè fare niente. E il padrone del terreno non viene neppure risarcito: neanche un centesimo!

E se a quel padrone qualcuno vuole fargli un dispetto, durante i dieci anni gli dà fuoco di nuovo, e i 10 anni non finiscono mai!

Io dico che non hanno capito proprio niente dell'agricoltura Sarda né di quella Italiana. Più che altro, noi viviamo dalla pecore, non e' che abbiamo un' agricoltura così sviluppata, in tutti i

settori. Qui è più sviluppato l'allevamento, perche in Sardegna ci sono più pecore che in tutto il resto dell'Italia.

Il formaggio prodotto da questi allevamenti è destinato al consumo locale o anche all'esportazione?

In gran parte il formaggio è destinato all'esportazione. In Sardegna ci sono tre milioni di pecore (e 1,6 milioni di abitanti, secondo il censimento del 2012. n.d.r.). Non c'è possibilità di consumarlo tutto. Lo esportiamo anche da voi negli Stati Uniti (fra gli intervistatori c'è una studiosa statunitense. n.d.r.); lo chiamano "Pecorino Romano" ma per il 90% è prodotto in Sardegna.

Come è ripartito il pascolo per le vostre bestie, fra aree boschive di cespugli e prati naturali?

Per lo più abbiamo prato naturale, perche ci sono tante leggi e regolamenti che impediscono di arare, almeno da queste parti. E' un peccato perchè un ettaro coltivato rende più di 10 ettari allo stato naturale. Ma questo (i politici che fanno le leggi) non lo capiscono. Se ne infischiano. Hanno la loro bella scrivania; vivono bene. Noi guadagnamo 1000 massimo 2000 euro al mese quando tutto va bene. Loro guadagnano 20000 o 30000 euro al mese, e stanno bene, questi politici che scrivono le leggi.

Che tipo di foraggio utilizza?

Lo usiamo, ma non lo produciamo. Abbiamo anche l'erba medica, perche alla figliatura (quando partoriscono) teniamo le pecore negli ovili, in modo da non perdere gli agnellini. La resa è alta, e questo va tutto a vantaggio delle pecore, perche dobbiamo dare a ciascuna, in un giorno, almeno 1Kg di mangime concentrato, e poi un'altro Kg di erba medica e 1 Kg di fieno.

E riguardo alle capre?

Le capre hanno meno necessità; sono più adattabili. Io allevavo la capra Sarda: tipo Sardo, ma ce le hanno abbattute tutte per quella malattia la scrapia (Scrapie), che noi chiamiamo "malattia della pecora pazza", ma il nome vero viene dall'inglese: scrapie.

Un altra volta me le volevano abbattere ed erano sane: quella volta sono riuscito ad evitarlo, ma nello stesso periodo mi hanno abbattuto 620 pecore, che mi hanno risarcito. Per il valore della pecora avevano adottato la quotazione del giornale "Sole 24ore", riferita al giorno dell'abbattimento. Ora invece no. Ora danno anche il mancato guadagno: un vantaggio per noi. Quella volta, che per me era la prima, i veterinari promisero che dopo 20 giorni avrei potuto comprare di nuovo il gregge, ma trascorse quasi un anno. Mi hanno preso in giro.

Addirittura il capo dei veterinari di Nuoro mi ha promesso che avrei potuto ricomprare un gregge dopo 20 giorni. Per avere i soldi del rimborso ci sarebbe voluto più tempo, ma io ero disposto anche a prendere soldi in prestito, per ricomprare un gregge. Io senza il bestiame non posso rimanere perche devo lavorare. Mi hanno presso in giro. Ho potuto comprare il bestiame solo dopo un anno. Nel frattempo, dicevano che avrebbero dovuto curare il terreno perchè era infetto, questa era la loro valutazione. L'altra volta che avevano abbattuto, mi hanno dato una ventina o trenta Kg di soda caustica, per la disinfezione, ma ce ne sarebbero voluti quintali; molti quintali. Perchè noi abbiamo oltre 300 ettari di terreno, più altri 50 in località Prato Sardo. Ho quasi 400 ettari di terreno, pero ci lavorano anche i miei 3 figli, non ci sono sono solo io. Prima qualche persona la assumevo, ma adesso i figli sono grandi, sono esperti, accudiscono il bestiame, sanno arare Abbiamo anche i mezzi agricoli, anche se in parte non ce li lasciano usare. Se mi avessero lasciato fare, ne avrei fatto un giardino, ma non vogliono.

Utilizza qualche tipo di associazione di colture (ad esempio leguminose più graminacee, ...)? A che tipo di sistema di rotazione fa ricorso?

La rotazione va fatta per forza. Si tiene il bestiame in un appezzamento di terreno, e se ne lascia riposare un'altro. Perchè l'erba deve avere il tempo di crescere. Se lasci il bestiame sempre nello stesso pascolo, dopo un po' l'erba scarseggia, e il bastiame deperisce, perchè passa la giornata a

correre da una parte all'altra affamato, litigioso. Noi abbiamo le chiudende, che delimitano 25 o 30 ettari di terreno, completamente recintati. Di questi appezzamenti ne abbiamo almeno una decina qui. Poi altri ne abbiamo altri a Prato Sardo anche quelli sono chiusi, e gli animali li facciamo pascolare dove vogliamo: dieci giorni qua, dieci giorni là. A Prato Sardo è veramente bello perchè li si può arare: abbiamo una ventina di ettari di erbaio e anche se è una brutta annata c'è l'erba alta un metro. Perchè dove si può arare e concimare l'erba cresce molto meglio che nel prato lasciato a sé stesso.

In che stagione affronta la scarsità di cibo per gli animali?

Sicuramente d'estate, perchè non piove. Penso che sia così anche da voi. Qui la massima produzione di pascolo l'abbiamo in primavera. Anche in questo periodo l'erba è abbondante, ma quando arriva la siccità, in estate, allora si secca, e diventa fieno e non da nutrimento al bestiame. E' un momento difficile per le bestie, ma non per la capra. La capra anche in piena estate continua a nutrirsi bene, anzi si ingrassa in estate, con qualunque tempo, perchè si nutre di arbusti e cespugli ed è soddisfatta. Invece la pecora mangia sì gli arbusti, ma non è la sua dieta preferita.

In genere, fa ricorso ad integrazioni supplementari?

Sì, diamo il mangime soprattutto alle pecore, perchè altrimenti non potremmo mungere. Diamo mangime concentrato, con grano, mais, o orzo, per mantenerle in carne e migliorare la produzione di latte. Col solo fieno la resa sarebbe scarsa. In estate diamo circa trecento grammi per ogni capo.

Alle capre in genere non ne diamo, perchè non ne hanno bisogno. Le capre brucano anche l'erba, ma per per lo più si nutrono di arbusti, e vivono bene. Non avrebbero bisogno di mangime. Ma noi un po' glie lo diamo, in genere mais, per attirarle nell'ovile quando dobbiamo mungerle.

Quindi le capre sono avvantaggiate rispetto alle pecore perchè per tutto l'anno possono brucare anche arbusti e cespugli?

Certo. E per noi questo è un vantaggio, perchè possiamo tenere le pecore e le capre nello stesso pascolo. Le pecore si nutrono d'erba mentre le capre preferiscono arbusti e cespugli.

B. ALLEVAMENTO DI ANIMALI

A quale razze appartengono le sue capre?

Abbiamo sempre allevato la razza Sarda, ma due anni fa abbiamo dovuto farle abbattere tutte a causa di un'epidemia. Adesso ne abbiamo poche, una cinquantina, incrociate con la razza Maltese.

A parte queste, ne abbiamo altre 190, provenienti dall'Asinara, che sono proprio Sarde, e sono completamente selvatiche. Fanno quello che vogliono e non c'è verso nemmeno di acchiapparle. E' come se non le avessimo. Non danno latte, nè capretti. Saltuariamente ne abbiamo ucciso qualcuna per mangiarne la carne. A volte scappano dai recinti, e scappano, e arrivano fino alla periferia di Nuoro.

Allora arrivano i forestali per protestare, e noi gli diciamo che se le riprendano, visto che sono stati loro a portarcele dall'Asinara.

E circa la metà sono maschi, inafferrabili, come se non esistessero e ogni tanto qualcuno di questi viene ucciso da un cane randagio.

Lascia il bestiame al pascolo tutto l'anno? Altrimenti, in che stagione le capre rimangono in ovile?

Le capre rientrano all'ovile per la mungitura, o per alimentare i capretti, due volte al giorno, per il resto del tempo stanno fuori, al pascolo. Quelle che hanno figli piccoli trascorrono la notte nell ovile, con la prole, ma l'indomani mattina le rimandiamo al pascolo. I capretti invece rimangono sempre nell' ovile.

Di che genere di attenzioni e precauzioni necessitano le capre all'interno dell'ovile?

Il requisito più importante è la pulizia, degli animali e della stalla. Se occorre, la stalla va disinfettata con la calce (Disinfestazione), per prevenire la mastite. Quando una capra prende la mastite non da più latte, la mammella si secca, e spesso non resta altro che abbatterla.

Quali rimedi usate per la mastite?

La curiamo. Abbiamo delle siringhe. Si inietta la medicina direttamente nella mammella, ma non si arriva mai ad una guarigione completa. Se contrae la mastite l'animale è destinato ad essere abbattuto. Noi la curiamo perchè l'animale macellato per scopi alimentari deve essere sano.

Oggi esistono queste siringhe per iniettare il farmaco direttamente nella mammella, ma prima di queste come si faceva?

Prima usavamo metodi ormai molto sorpassati. Si poteva pulire la mammella e frizionarla con una poltiglia di cenere e acqua (liscivia a freddo), che aveva una funzione disinfettante. L'infezione a volte passava, ma l'animale non dava più latte. Oppure praticavamo dei salassi, incidendo una vena che si trova vicino all'occhio, o nella coda. Oppure scoprivamo, recidendo prima la pelle, la vena che si trova nell'addome e porta il sangue proprio alla mammella; la bucavamo con un'ago e lasciavamo defluire il sangue infetto per 10 o 20 minuti. Al termine, per mantenere chiusa la ferita, ci infilavamo una specie di grosso spillo di legno, che chiamavamo “sa zola”; lo lasciavamo in sede per tre o quattro giorni finchè la ferita non era rimarginata. Anche questo era un tipo di salasso, ma sono cose che oggi non si fanno più.

Non siete mai riusciti a debellare questa malattia?

Mai. Si ripresenta tutti gli anni. La mastite secondo me nasce dalla sporcizia. Infatti si devono usare delle lettiere apposite; oppure si da la calce sulle lettiere, in modo che l'infezione non si trasmetta. Perchè è anche contagiosa. E ci sono anni in cui si trasmette con maggiore velocità, e una bestia ammalata dopo poco ne infetta tante.

Col latte prodotto da queste capre ammalate che cosa fate?

Assolutamente niente. Va distrutto. A parte che la bestia con la mastite di latte ne produce ben poco, quel poco che produce non ha neanche l'aspetto del latte. Sembra pus.

In quale momento lei si accorge che il colore del latte è diverso?

Ci accorgiamo subito. Fra l'altro la mammella è calda, e produce pochissimo. Ma si vede anche guardando la bocca. Chi fa il nostro lavoro se ne accorge subito. Forse lei è veterinario, laureato, ma noi che lavoriamo sul campo facciamo la diagnosi anche prima del veterinario. Tutto grazie all' esperienza. Alla vita.

Quante volte all'anno si riproducono le capre?

Se la lasciamo fare due volte, ma noi ad un certo punto allontaniamo i maschi, altrimenti le affaticherebbero troppo le femmine, e il periodo della mungitura sarebbe dimezzato. Invece così l'animale da latte per tutta l'estate. Quindi le nostre capre si accoppiano una volta all'anno.

Quando tempo lasciate l'ariete con la capra?

Circa 20 giorni; massimo trenta. Il mese dell'anno dipende da quando vogliamo che nasca la prole. Noi abbiamo pecore alle quali abbiamo tolto gli agnelli 15 giorni fa. Pero in generale le pecore figliano in questo periodo. Infatti un altro nostro gregge sta figliando ora. Le capre invece no; non sono ancora pronte per figliare. Inizieranno a partorire fra 20 giorni

Utilizza l'incrocio per la selezione del bestiame?

Si. Per le pecore lo facciamo con maschi di nostra proprietà. Per le capre invece collaboriamo con altri allevatori. Purtroppo l'anno scorso siamo stati costretti ad abbattere tutti i maschi delle pecore, e abbiamo dovuto ricomprarli. Cinque li abbiamo portati addirittura da Bonassai. Bonassai e' una scuola agraria importantissima, non solo in Sardegna ma in tutta Italia. Gli arieti erano bellissimi, ma cari.

Fa ricorso all'inseminazione naturale o artificiale?

Generalmente no. L'abbiamo giusto provata qualche volta. Altre volte però abbiamo provato con le agnelle, non l'inseminazione artificiale ma abbiamo forzato il "calore", e sono rimaste gravide entro due giorni. Le pecore primipare, intendo. Con le capre invece no.

Sempre accoppiamento naturale?

Si, sempre naturale.

Che caratteristiche deve avere un buon ariete per garantire la riproduzione?

E' determinante l'alimentazione, deve essere ben nutrito e sano. Io ho avuto spesso arieti da 50 chili di carne, non una volta, ma tante volte. Il peso è un buon criterio di valutazione. Le capre di razza sarda sono le più piccole che abbiamo; si aggirano sui venti chili. Se incrociate con altre razze arrivano anche a 30 o 35. Ma il maschio è sepre più robusto, e può arrivare a 50.

Un buon ariete quale altezza dovrebbe avere?

Al garrese deve avere un certa altezza e (posiziona la mano a circa novanta centimetri da terra) anche una certa robustezza; una groppa solida.

Che caratteristiche deve avere la pecora per garantire buona resa e un' elevata fertilità?

Per me la pecora Sarda è la migliore, come resa del latte, è più produttiva, più domestica. E' anche più versatile: si adatta al terreno, a pascoli diversi. Le altre razze, riguardo al pascolo, più sono selezionate e più sono più esigenti.

Anche delle capre, la razza Sarda e' quella che rende di più. Noi quest' anno, con le capre nella stalla, davamo un chilo e cento di mangime al giorno, suddiviso fra mattina, mezzogiorno e sera, più erba medica e fieno a sazietà, e la mungitura arrivava a 1,80 – 2 litri di latte al giorno. Ora che le abbiamo tolte dalle stalle, a pascolare all'aperto, la resa è calata, anche a causa delle intemperie e della razione ridotta di mangime. Ne diamo loro 500 grami al giorno di mangime: 250 la mattina e 250 la sera, per convincerle entrare nelle catture, per poterle mungere. Le catture sono delle rastrelliere, con piccoli alloggiamenti delle dimensioni di una capra, che trattengono

l'animale durante la mungitura. La capra entra dentro la cattura, attirata dal mangime e un meccanismo le impedisce di scappare. Entrano solo se mettiamo il mangime. Altrimenti dovremmo mungerle una alla volta, spingendole a turno attraverso un passaggio obbligatorio, ma è faticoso, invece nelle catture e più semplice.

Noi abbiamo anche la mungitrice, non la usano neanche miei figli. La mungitrice va bene, perché ne munge 24 per volta, ma ne ospita 48, e svolge il lavoro in due fasi.

Ma tuoi figli praticano sempre la mungitura manuale?

Loro mungono sempre a mano, abbiamo munto tanti anni con la mungitrice perché ce l'abbiamo da almeno 15 anni, e primi anni mungeva anche mia figlia che viene sempre. (E' diplomata, ma non ha continuato a studiare, ha solo preso il diploma di ragioneria. Invece la sorella si è laureata ed insegna alle scuole medie di Orotelli; a lei piaceva studiare, invece la sorella era un maschiaccio le piaceva andare a cavallo e cose del genere. Però il lavoro di campagna le piace.)

A tua figlia piace la mungitura a mano?

Si lei munge a mano, come ha imparato da me. Da quando era piccolina, ha sepre seguito le mie orme. E le è sempre piaciuto cavalcare.

Quale è la differenza tra la mungitura meccanica e quella manuale?

Il tempo necessario è uguale perché dobbiamo calcolare anche i tempi morti, la sistemazione degli animali nelle 48 postazioni, poi il tempo per liberarle e fare entrare le altre 48. Se consideriamo il tempo si fa prima a mano. E poi non hai spese quando mungi a mano: non si usa elettricità, non si usano detersivi per la pulizia.

Per quante capre utilizza un ariete per inseminazione naturale?

Un ariete di capra può fecondare circa 20 capre, invece l'ariete delle pecore riesce a fecondare circa 50 pecore, se mantenuto bene. L'ariete di capra anche se e' più robusto si riproduce meno.

In che modo riconosce il periodo migliore per l'inseminazione?

L'inseminazione naturale avviene sempre a giugno e luglio.

Quali sono i sintomi del calore che presentano le capre?

La capra diventa più mansueta, va' appreso all'ariete, si capisce comunque che e' il periodo giusto. Le sale anche una leggera febbre.

Dai genitali esterni hanno una fuoriuscita di liquido o cambiamento di colore? Quali sono i sintomi?

Ripeto: diventa più mansueta con una leggera febbre, che dura qualche giorno. Se non rimane incinta, dopo 20 giorni ripresenta gli stessi sintomi.

Che tipo di inseminazione (naturale o artificiale) è più semplice, conveniente ed economica? Quale preferisce? Perché?

In poche parole, l'inseminazione artificiale e' una forzatura contro natura, quando l'animale e' pronto, il suo fisico e' più robusto, se e' magra e la forziamo rischiamo di farla morire.(36.43)

E' possibile che una capra partorisca gemelli?

Più di una volta, ho avuto una capra che ne ha partorito 4, anche 3. Addirittura una anche 5. Mia figlia ha le foto: sembrava una scrofa (maiale femmina) coi capretti appresso, e' rientrata a Nuoro ed e' ritornata con la macchina fotografica. 5 gemelli è accaduto una sola volta, ma 4 molte volte.

Anche questo anno una pecora mi ha dato 3 agnelli, tutte femmine e tutte nere, due li ha allevati mio figlio.

Come capisci che la capra potrà avere più di un capretto?

Se una capra partorisce gemelli, come fai a saperlo prima?

Certo! Si capisce dal corpo, che più appesantito e ingrassato, e se non te ne accorgi, non capisci niente. Se confronti una capra che ha un capretto, e una che ne ha tre, sono mompletamente diverse. Quella coi gemelli è tutta bella grossa, come una matrona.

Riesci a capire prima del parto se possono nascere più di un capretto?

Si, si vede. Quella che ne avrà uno e' più longilinea (snella): ha il ventre ingrossato, naturalmente, ma se i capretti sono più di uno, la pancia è molto più grossa.

Ci sono altri sintomi?

No. Altri sintomi no.

Hai esperienza per capire toccando la pancia quanti capretti ci sono? 38:38

Si, toccando la pancia si, perché senti il duro delle ossa del feto dalla pancia, quello si, e una cosa facile, devi toccare quasi al fianco delle mammelle, allora. E, si sentono proprio i feti li, e quando arrivano a 3,5 mesi allora li senti anche muoversi, si vede la pelle muoversi, come se lì dentro stessero giocando.

Quali altri prodotti fornisce la capra, oltre ai capretti?

Produce molto più latte delle pecore, produce più una capra senza mangime, che una pecore con il mangime.

Come impiegate questo latte? Quali prodotti ottenete da questo latte?

Facciamo il formaggio.

Un tipo di formaggio o tanti tipi?

Noi facciamo formaggio Sardo un semi stagionato, e ora lo stanno facendo i miei figli, ti faccio vedere?

Che tipo di materiale si usa per la fermentazione?

Mettiamo sempre le pellette (caglio granulare essiccato) di bovino; di vitelli. Perché quello di pecora rende il formaggio troppo piccante. Per fare il Romano mettiamo le pellette di pecora, cioè di agnello e diventa molto piccante. Infatti il Pecorino Romano è sia piccante che salato, e a noi in Sardegna non piace. Ma è molto apprezzato all'estero, ad esempio in America.

Quali attrezzature e tecnologie si usano per il processo di trasformazione del latte?

Abbiamo i mini caseifici, altrimenti si fa alla Sarda, con delle caldaie da 100-120 litri, e si riscalda il latte, ora col gas ma un tempo si scaldava con la legna si faceva prima il formaggio e poi la ricotta.

Lei ha queste attrezzature per la lavorazione?

Certo. Li vuole vedere? Andiamo insieme così le mostro tutto: la mungitrice, il minicaseificio. Come attrezzature abbiamo tutto.

Ha detto che anche sua figlia lavora in azienda. A quali fasi della lavorazione prende parte?

Si, lavora spesso qui in azienda. Più che altro adesso si occupa degli alveari (api), però aiuta anche i fratelli quando ce ne bisogno. Ho tre figli maschi e due femmine; cinque tutto. Una insegna, ma l'altra non ha voluto studiare, però ha preso il diploma ma ha detto che era solo carta straccia e che non se ne faceva niente: lavora in famiglia e si interessa alla vendita del formaggio. Ma ne cura anche la stagionatura, perché il formaggio deve essere capovolto periodicamente in cantina. E' un processo abbastanza laborioso.

Che tipo di lavoro compete alla donna nell' azienda agricola?

Alle donne? Da me comanda mia moglie, in Sardegna vige il matriarcato soprattutto nella campagna, noi lavoriamo e i soldi li portiamo a casa e li tiene tutti lei. Lei dirige tutto, e si occupa di tutti i bisogni della famiglia. Io non mi occupo della famiglia, ci pensa tutto lei. Certo, sono io che lavoro e produco il reddito. Ma l' economia della famiglia è affidata alla donna.

Che uso si fa della pelle di capra?

La vendiamo agli industriali delle concerie. Ce n'è una a Nuoro.

I grossisti prendano le pelli, e le portano ai conciatori nelle concerie. Noi non ce ne facciamo niente delle pelli, prima si facevamo le bisacce, se vuole glie ne mostro qualcuna. Serviva per portare il cibo del pastore, quando passava le giornate all'aperto, col bestiame. Il nome in Sardo è "sa taschedda". Ci sono anche altri oggetti che si facevano anticamente con le pelli, e che io non ho conosciuto, come le otri , per mettere i liquidi. Il pastore un tempo si arrangiava e si ingegnava a creare anche gli utensili tipo forchette e cucchiai fatte sia di corno che di legno.

Quali altri prodotti si ottengono dalle capre, oltre al latte, nella tua azienda?

I capretti e il latte. Tutto qui.

E dal latte cosa si produce?

Si produce "sa fruee", che è latte cagliato, che fate anche voi in Afghanistan e anche in certi paesi Africani. Poi si produce formaggio e ricotta. Poi c'e'un altro tipo di formaggio che viene salato e seccato che chiamiamo "merca".

Quali sono i prodotti più importanti e più redditizi?

I capretti, per il consumo di carne, e il latte delle capre. Anche la capra viene abbattuta e macellata, dopo 13- 14 anni, perchè è ormai vecchia e non rende più. Invece la pecora viene abbattuta intorno agli 8- 9 anni. La capra campa quasi il doppio più a lungo della pecora, perché non perde mai i denti , invece la pecora perde i denti, come li ho persi io, e bisogna abbatterla.

C. ETNICO MEDICINA VETERINARIA

Descriva alcune esperienze che avete avuto con malattie degli animali nella vostra vita di lavoro

Più che altro, a causa delle malattie, abbiamo subìto l'abbattimento di tutte le capre. Poi c'è la mastite, che si ripresenta ogni anno. Poi c'è quella che è arrivata dal continente, per la quale

facciamo il vaccino tutti gli anni: molti la chiamano “asciuttarella”, ma il nome appropriato è “agalassia contagiosa”.

C'è la famosa Lingua Blu, che colpisce solo le pecore.

C'è anche una malattia che viene solo alle capre, che noi curiamo. Sono come di bastoncelli di carne che crescono all'interno delle labbra e della bocca, e rendono dolorosa l'ingestione di cibo; l'animale deperisce, ma in genere non muore. Questa riusciamo a curarla, specie se ce ne accorgiamo subito: allora, con un paio di forbicine, tagliamo questi bastoncelli, dalla base, dentro la bocca. C'è un po' di sanguinamento, come se fosse un salasso, ma dopo pochi giorni l'animale guarisce.

E ancora c'è la “zoppia”, che colpisce il piede dell'animale, che sembra che marcisca. Allora dobbiamo rimuovere questa parte infetta e applicare il verderame. E' una malattia brutta. Ma in genere è colpa del pastore, che non cura l'igiene delle stalle. Se il pastore tratta i locali periodicamente con calce viva, questa malattia non si presenta.

Che cosa si fa’per prevenire questo tipo di malattia?

La zoppia? Si. Ci vogliono cure, dove dormono gli animali nella stalla deve sempre esserci uno strato sufficiente di calce che mettiamo almeno una volta alla settimana o dieci giorni, sopra la lettiera. Questo è il metodo che conosciamo per prevenire la zoppia. Disinfezione.

Quali sono le ragioni e i motivi per i quali una capra o un capretto perdono peso? Che esperienza avete avuto?

Il motivo sono certe malattie, ma soprattutto è l’ alimentazione: se la capra è sana e mangia bene non perde peso.

(Osserva una foto con una capra di aspetto denutrito) Questa capra è malata. La causa? Potrebbe essere la malattia di cui ho parlato prima: noi la chiamiamo “sos ispinales”, e si manifesta con la crescita di escrescenze di tessuto carnoso sulla bocca. Se gliele tagliamo le capre dopo un po'

guariscono. Ce ne accorgiamo quando le vediamo che non pascolano e sgocciolano saliva dalla bocca. Ma intervenendo subito guariscono presto.

Qual è il significato se la forma degli occhi sono dissimili? Quali esperienze avete avuto? 52:00

Questo non è un sintomo di malattia, ma una caratteristica che a volte si presenta. Non capita spesso, sono pochi i capretti che nascono con gli occhi di due colori diversi, ma non è una malattia, è la natura: un' eredità genetica, si trasmette da uno al altra, ma sono pochi capi.

Così come pochi sono i capretti che nascono con 4 capezzoli sulle mammelle. Noi glieli tagliamo, quando sono ancora piccoli, altrimenti perdono latte dai 4 capezzoli, se invece viene tagliato e cauterizzato non succede. Li asportiamo con un paio di forbioci, allora la mammella sovrannumeraria non cresce e il latte arriva solo nelle mammelle principali. Perché i capezzoli piccoli che sono dietro , se lasciati, danno poco latte che si perde.

Quando praticate questi tagli, applicate poi erbe medicinali, o farmaci?

No, non c'è bisogno. Asportiamo in pratica un pezzetto di pelle. Guarisce subito; dopo tre o quattro giorni la ferita è rimarginata.

Per quanto riguarda le pecore controlliamo le mammelle durante la tosatura, e se è necessario tagliano i capezzoli in più. Il pastore incompetente invece lo fa più tardi, quando le capre figliano e si accorge durante la mungitura che le mammelle posteriori bagnano le mani.

(All'intervistato viene consegnata una foto in primissimo piano dell'occhio di una capra)

Questa è congiuntivite. Per questa malattia ci sono le medicine, ma sono eventi rari: in un gregge di cento capre, possono presentarsi 1 o 2 casi all’anno.

Qual è il significato di una secrezione mucosa anomala dal naso e dagli occhi di una capra? Quali esperienze avete avuto?

La colatura dal naso può essere causata da una mosca, che entra dentro il naso deposita le uova, e quando nascono le larve la capra tenta di espellerle tossendo. E' una larva molto grossa, noi la chiamiamo "verme di corno". E' molto fastidioso e fa quasi impazzire la capra ,che corre disperata. Questa mosca si insinua nel naso quando l'animale sta riposando, all'ombra. Addirittura mi è capitato di togliere le larve dall'occhio di un servo pastore che lavorava con me. Si vedevano i vermicelli che correvano nell'occhio. Nell'occhio rimangono tre o quattro giorni poi, attraverso le vie lacrimali, arrivano al naso, e qua dentro, da quasi invisibile, cresce un verme grande quasi quanto mezzo dito. Poi va nella terra e si trasforma (crisalide) in una specie di mosca quasi una farfalla.

Avete alcune piante mediche in questo settore? Ne conosce qualcuna?

Noi non le usiamo, ma ci sono. Quali sono? C'è la malva, lo pistiddori (ortica), che se la tocchi i da' prurito, si mangia anche, ma noi non la mangiamo, però in molti posti si mangia, fatte ad insalata, non e' velenosa come altre piante tossiche. Piante curative per il bestiame ci sono, ma non le usiamo più. Anticamente si usavano, in forma di cataplasmi, ma oggi esistono i medicinali che danno l'effetto giusto. Da voi senz'altro ci sono e le usate. Noi non le usiamo.

D. LOTTA ALLA POVERTÀ

Quali sono i vantaggi dell'allevamento dei caprini per voi e la vostra famiglia?

Così in breve non saprei fare un calcolo. Innanzitutto ci sono i capretti: in media due all'anno, perché sono poche quelle che danno un solo capretto e poche sono quelle che danno tre. La media è due.

Mentre per gli agnelli (dalle pecore) la produzione media è di 1,25 all'anno. In più il capretto ha un prezzo doppio rispetto all'agnello, perche l'agnello ce lo pagano a 4 euro, e il capretto a 8 Euro.

E poi l'allevamento della capra comporta meno spese, perche lei resiste di più con poco mangime, solo che il latte di capra ha un prezzo più basso, però invece di un litro dà 1,5 litri di

media. E recupera cosi. Il latte di capra vale un terzo in meno di quello di pecora. Questa anno ce l' hanno pagato a 49 centesimi al litro quello di capra. Quello di pecora a 62 centesimi al litro.

Può l'allevamento delle capre dare lavoro ad altri membri della comunità?

Direi di no. Il bestiame che abbiamo noi è poco: ce l'abbiamo sempre fatta coi miei 4 figli. Sempre lavoro familiare, quando abbiamo preso qualche altro era per fare altri lavori ma sul bestiame lavoriamo sempre noi.

Quando vendete le pelli ad altre persone questo non crea altro lavoro?

Le pelli le compra l' unico commerciante di Nuoro, che acquista in tutti i paesi limitrofi e poi le rivende alle industrie conciarie.

Chi acquista le pelli crea un giro di affari che produce lavoro per altri?

Non in Sardegna. Non abbiamo più le concerie. Un tempo c'era a Ghilarza una conceria, ma poi l'hanno chiusa, probabilmente era un'industria che non rendeva abbastanza. Oggi le pelli vanno tutte nel resto d'Italia dove ci sono le concerie.

Quali influenza hanno le capre sulla produzione di foraggio?

Le capre nessun influenza. Può accadere negli allevamenti di capre intensivi: animali confinati nelle stalle e alimentati con mangimi, erba medica e fieno, che non stanno allo stato brado; noi li lasciamo liberi di pascolare, in tutte le stagioni.

Che rapporto c'è scorre tra capre e boschi?

E li che vuole vivere la capra, vuole proprio la foresta, la preferisce al terreno agricolo, perchè ha bisogno di vivere in simbiosi con i boschi. Da voi il territorio è desertico, da noi invece il terreno è poco ma boscoso.

Si può parlare allora di una simbiosi fra le capre e il bosco?

Il bosco è proprio il posto giusto per loro. Pascolano nel terreno boscoso, mangiano tutto, il leccio, la quercia, i rovi, il rovere. Un po' meno il corbezzolo. Gradiscono anche un altro arbusto, che noi chiamiamo Fillirea, che migliora la produzione del latte. Mangiano decine di tipi di fogliame. Quello che non mangiano è l'oleandro, quello è velenoso. Il bestiame sa ciò che non deve mangiare. In Sardegna ci sono milioni di pecore ma meno capre, a causa della disponibilità del terreno. Il capraro in genere frequenta il bosco mentre il pecoraro deve scegliere il pascolo, la prateria. Possiamo dire che il capraro vive in simbiosi col bosco.

Se dipendesse esclusivamente da lei, quale di queste attività sceglierebbe? E perché?

Se io dovessi nascere adesso questo lavoro non lo farei più perchè è troppo faticoso e poco pagato. Non hai mai un giorno libero. Non conosciamo la domenica, non conosciamo sabato, non conosciamo feste, o il giorno di Natale. La Pasqua tutti festeggiano a casa, noi dobbiamo essere qua a lavorare. Certo, anche noi rientriamo a casa, la sera, ma il lavoro impegna tutti giorni. Non puoi lasciare il bestiame senza mungitura, perché se lasci oggi, poi domani, possono non fare più il latte, deve essere un lavoro continuativo. Adesso miei figli si alzano verso le 7. Mentre io alle 7 avevo già fatto il formaggio, iniziavo sempre alle 5 di mattina, mungevo, poi facevo il formaggio. Loro invece non vanno d'accordo con me in questo senso, io il bestiame dovevo spingerlo fuori dalla stalla prima possibile, perché più ore pascolavano e più latte producevano. Invece miei figli non fanno cosi, loro danno il mangime però latte ne producono più di me. Invece io non davo mangime e producevo meno latte. Se ora hanno un centinaio di pecore dopo che nascono gli agnelli, danno circa 140 litri di latte, io con 100 pecore producevo massimo 50 litri i latte.

Quali aspetti della vostra attività sono speciali o unici? C'è qualche cosa che sapete fare meglio di altri? E in tal caso, dove sta la differenza?

In effetti non facciamo nulla di straordinario. Molti pastori sanno fare il formaggio. E' anche vero che molti non lo sanno fare, e se vogliono mangiare formaggio devono comprarlo.

Io il formaggio l'ho sempre fatto e i miei figli continuano a farlo, perché c'è molta differenza di prezzo tra un litro di latte e un chilo di formaggio. Un litro di latte è pagato 1500 lire (0,80euro), un chilo di formaggio 3mila lire (1,60 euro). Il doppio, mi hai capito?

C'è qualche nozione o tecnica particolare che lei ha imparato da suo padre o dai suoi nonni, che ancora sopravvive nel suo lavoro?

E' tutto più o meno come ai tempi dei miei genitori.

La differenza principale sta nella temperatura di lavorazione del latte: un tempo si manteneva sui 35~37 gradi. Noi invece lo portiamo alla temperatura di 42~43 gradi, per fare il semicotto.

E c'è un'altra cosa: mio padre il formaggio lo lavorava molto; più a lungo di quanto facciamo noi. Lo pressava e rigirava più volte, pigiando il formaggio nella forma, in modo da farne uscire il grasso. Infatti la sua ricotta era molto ricca, migliore della nostra. E il formaggio che produceva era meno grasso, ma anche meno saporito.

ANNEX II

NARRATIVES

Abdullah Halim
Discovering and resolving value, goat breeders' local knowledge in Sardinia
Scuola di dottorato di ricerca in Scienze e Biotecnologie dei Sistemi Agrari E Forestali e delle Produzioni Alimentari, Università degli Studi di Sassari

BREEDER A

Mr. Carta Salvatore Narrative

Lanaitto - Dorgali, Sardegna, Italy - 27.11.2012

My name is Salvatore Carta. I live in Dorgali, a municipality in the Province of Nuoro, Sardinia region, Italy.

I belong to the fifth generation of a family of goat breeders. I have been working with my parents since I was a child. I work now with my two sons (like many people in the same business, Mr. Carta learned goat herding from his ancestors and his progeny is expected to learn the same occupation from him). When my parents started to work here, it was a natural forest mountain side, within a vast uncultivated forest area. Over time we converted some parts of it to cultivated land.

At first there were more trees, natural trees. We had to cut down some of them, to be able to plow at least a few hectares, so to start our own cultivation of crops and fodder. Here we have approximately 140 hectares of land, with about 100 hectares in cultivation (of typical farm ground). The rest is native pasture and woodland.

The cultivated area has very fertile soil (also known as river bottom or kick bottom ground). We can cultivate wheat, barley, maize, corns, oats, alfalfa and clovers every year. We are doing intercropping (Legumes into gramineae), to produce high value nutrient forage. We perform rotation to keep the land clean from weeds and to conserve land fertility.

Goats graze all year round in the pasture. They graze at different seasons in different places, From January 20 until February 20, goats graze into sowing grassland. Later during summer they go deeper to graze into the forest or in the mountains, and then they search cooler places because

the heat is the first cause of diseases. At the beginning of autumn, after early rains, the grass starts growing again. Goats graze on fresh herbs in the smooth, cleaner and more comfortable lands. In the winter goats feed on drought forage which is harvested from the cultivated area.

During food shortage (August, September and October), goats feed on a little concentrate too. Supplementary food "concentrate" is necessary for increasing animal's productivity and to help during food shortage. In addition to feeding, the goats need a clean stable. We place hay on the floor in the stable, to keep it comfortable and dry. It is an important instrument for the goats health to keep them safe from wet and fungus infection.

We are rearing Sarda breed or RusticaSarda because it is adapted for these mountainous areas and it is suitable for this kind of pasture. It is a local intensive goat rearing system, which is managed by family members. All material and tools are simple and made by natural sources such as wood. In the stable, we keep separate places mothers with kids from adult livestock. Possible ill or infected animals are isolated from the others until complete healing.

We try to select young female goats which have a genetically softer udder rather than hard. That will take time, as soon as we follow selection to raise the flock from these goats. The two most important products of our goats are the kids and milk.

The Sarda goat can reproduce twice a year, but we prefer one time a year because in this way, goats will have a longer milk production period: around eight months. Milk is our most important source of income.

We perform only natural insemination, because it is natural, economic, simple, and convenient and it is easy to manage kidding. One buck is capable to fertilize thirty to forty goats on average. A medium, healthy, strong, normal feature and enough robust Sarda buck is good for reproduction.

The doe which is has been selected for reproduction should be healthy, strong and mature (at least have 10-12 months old) with a softer udder. Buck capacity, to inseminate the does at natural

insemination, is related to age, genus, nutrient and climate, so it varies from 20-60 goats. (The number of females that a ram can successfully breed in a given time depends upon the intended use, age and experience of the ram. Young, inexperienced males are not able to fertilize as many females as older more experienced males do.)

We observe some signals to recognize the proper time for insemination. The milk production lowers, body temperature rises, and the does start jumping over each other, often bleating. (Common signs of estrus include tail wagging, receptivity to and actively seeking bucks, mounting and bleating. Singh-Knights and Knights, 2005).

From the copulation with the ram, I can start measure the gestation period of the doe. The most evident sign is the increasing volume of the belly. Eventually the udder cells (milk glands) start to produce milk. Due to the extra weight, every movement, even walking, seems to be more tiring for the goat. Also the udder is a good indicator too because, before kid birth, it becomes full of milk.

Goats frequently can deliver more than one kid. Actually we have a high rate of twin pregnancies. We can easily know if the goat is carrying more than one kid, long before the birth. We touch the belly, especially in the morning, because at night the pregnant goats stay closed into the pen, without grazing, so in the morning their stomach is empty and it's easier for the breeder to touch the belly and to recognize the skulls of the fetuses. I have been doing this job since I was a baby, from 11 -12 years old. Experience is crucial, we can often tell the number of the kids just watching the way a goat walks, we don’t need to touch it.

Other products in addition to kids which we are producing in this farm are milk, meat, wool, hides and manure.

The lactation period of our goats is about 7-8 months. Sarda goat produces one liter or one and half liter per day, for around 5-6 months, then it falls down. The first month after kidding the Sarda goat produces on average of one liter. When spring starts, the growth of fresh grass

increases, this should increase also the milk production, that keeps this rate for all the summer. So the lactation rate is like an arc that goes uphill and then comes down.

Milking is a team work; we do it twice a day (in the morning and in the evening). In the morning, the first thing we do together and as fast as possible is milking. In the past, our parents or grandparents used to transform the milk in cheese, here at the farm. They used to sell the cheese, but the trading business was somehow uncertain and so were the related income. Now we sell almost the whole milk production to e Dorgali Cooperative: it's like earning a salary every month. For this reason I can feel economically safe.

Cheese makers put rennet for fermentation. They produce cheese and from serum which residue from this process makes ricotta (cottage cheese), it is a byproduct of the cheese.

Before having this kind of rennet they sell nowadays, we used to extract the rennin enzyme from the kid abomasum. When we slaughtered a kid, and we took the enzymes from its abomasum, we used to dry it. Kid rennet is different from that of other ruminants, because it contains the strongest enzymes. This enzymes are useful for fermentation. The dried enzymes were kept it the refrigerator. During the cheese-making process, the milk was heated into a large metal pot, then the enzymes were added and mixed into it to start the fermentation.

We use simple tools for processing milk, like a large wooden spoon, a cauldron, the forms, a cooking stove. We use also a drying chamber and brine solution so that cheese can age without getting mold.

I have two sons that work with me in the farm. We milk goats together because milking must be performed quickly, so that we can start cheese-making process as early as possible. Those who work in the farm must be familiar with these three main tasks: milking, cheese-making and cheese care along aging process. If one of us is busy with other matters, the others would perform all the steps on their own.

Our goats, have a pretty solid, durable and smooth skin. It is thin but resistant, naturally protected with soft warm fur. Nowadays we don't handcraft anymore goat hides: we just sell them to a broker. In ancient times, from the hides, they made bottles and bags, to carry the goatherd daily needs. At dawn the goatherd used to pack a bit of bread, a bit of cheese, a slice of bacon into this kind of leather bag, and that would fulfill his needs for a whole day in the countryside, along the flock. Beside that, many other items were realized in old times: saddlebags, shoes, belts and overcoats were made from goat skin.

The goat's wool was used too, and it was greatly appreciated. The goats were sheared during the springtime. From the ones who had thicker hair was obtained a special fabric, used to make "sa bertula". This is a traditional double bag, very versatile, apt to be carried horseback or worn over a man's shoulder. It was suitable to carry clothing, personal supplies, equipment, as good as fodder to feed the donkey, or livestock kids.

The meat of goats is very good to eat. It has a different flavor and taste because goat feed is different from the sheep's. Goat eats over the grass, shrubs or branches. So goat meat is more tasty and fragrant.

Goats are a living organism; diseases can be life threatening for them. But nowadays a goat can die from gastritis, or even from over-nutrition but they do not die anymore for epidemics. Forty or fifty years ago the very serious diseases of the goat were eradicated by vaccines, as “Foot-and-mouth disease” and “Anthrax”. Both of them could cause a carnage in the herds until the 50s. Our goat, Sarda goat, is a strong animal, pretty resistant to diseases. Only two kind of problems can arise, diarrhea and gastritis. We solve other problems by vaccination. We do maximum two times a year and cover throughout the year.

In everyday activity, we are attentive to the livestock condition. Several issues can affect the udder, caused by a disease or by wrong eating: mastitis, rupture of udder veins, rupture of capillaries. Sometimes, if the goat eats poisonous herbs, that can ruin the milk. It will be yellow instead of white. If we observe a change in the color of milk (red or yellow) we stop milking

immediately. The deteriorated milk must be kept apart from the good one, and must be destroyed as son as possible.

Another possible symptom of disease is the loss of weight. If a goat loses weight it may be: under-nutrition due to lack of appetite, or some kind of poisoning or some disease, or marching for too long a time, or weather change. Kid weight loss depends in mother milk, so a kid can lose weight when the mother feeds him deteriorated milk.

Mucus leaking from the nose of the goat can be caused in winter by grazing frozen pasture. So in truly cold days its better not to free the goats from the enclosure early in the morning, to avoid grazing frozen vegetables. In such cases we prefer to free the goats outside around eleven or at noon, when the pasture has been warmed an dried by the sun. Goats are capable to feed fast and grazing in a hurry. Three or four hours are enough for goats to feed.

Occasionally we use some healing plants to cure livestock illness. One of those we name “Crammediu” and we use it to heal wounds. It must be boiled and distilled and then stored in a bottle. At high concentration it's effective for injuries, it helps to heal wounds. At lower concentration rate it is useful by enteric administration to fight parasites.

Also hard liquor, a distilled beverage, is used to expel worms. There is this parasite, named the "tapeworm" that attacks the intestine. We can make the goat expel the “tapeworm” just feeding a little dose of liquor: half a glass of it, for two or three days in line. The liquor makes the goat expel the tapeworms and cleanses the intestines. They are simple medicines, our grandparents told us.

We have herded goats for many years from now, like our grandparents did, mainly to survive. Goats were preferred to the sheep because the land was not cultivated as it is nowadays. When Barbagia was covered by bushes an forests, it was perfect to breed goats, while the sheep could hardly survive. Today we have plenty of cultivated farmland, but there is still the mountain, with its wild vegetation, always good for goats. And now we have one more reason to keep breeding them: it's a new project that involves also my sons.

We are trying to realize a working both zootechnical and didactical farm. A place fit to show to young people and to students the way we manage our livestock. In this respect goats are very important, because goat herding is somehow declining. There are far more dairy and sheep farmers than goat breeders.

So the new generations, like the children from the primary schools and beyond, could come to visit the farm, to learn about the animals we breed and to study an ancient activity that can still offer professional opportunities to future generations.

If this project succeeds, this could be an additional source of income for my family, besides the kids, the milk and the goat meat.

We don't have an irrigation system. We basically depend on the weather. The land naturally is good now, because in the autumn it has rained enough and we can plow. But we must do it as soon as possible; say within 15 or 20 days. Otherwise the soil could become hard and arid, and the plowing task would become more difficult. This represents an additional load of hard work. In such cases we usually hire seasonal workers, equipped with their own machinery.

When the forage is growing, the goats must be kept apart, otherwise we would have no forage at all. We let them graze on the grassland until February, then we take them into the forest or into the bushes. Barbagia, our area, here around, is rich in vegetation of Holm oak. Goats live in symbiosis with forest. They like to choose their favorite plants, the shoots and the most sweet acorns. They are smart animals, and intelligent too. It's pretty interesting to see how they choose their favorite oaks, the ones with the sweetest acorns.

Lanaitto is a bed of a river. The limestone, over the centuries has produced and formed this valley and the layers of the land are excellent in providing adequate pasture for the goat.

So, the forest is rich in plants humus, in wood from tree rotting, in leaves. This territory is very good for grass growth and development. It is unlike of the basalt land, of a highland which has a very thin layer of soil and the grass grows in reduced form. In a highland rarely find forests of "Holm". We can find a little "'Olivastro", we can find a little "Lentischio". Instead here, thanks to God, the limestone terrain offers much, much more because it is formed in a different way.

I know than a breeder can do everything in the farm on his own: I do know people like that. But I prefer to work in team, because at the same time I can carry on the job and show what I'm doing to somebody else. Learning experiences and techniques from each other can increase production. One breeder must be able to do all three things, the management of goats, milking and transformation, they are all part of this job.

A breeder cannot specialize only on one task. It's like a blacksmith who only knows to make blades and don't know to make a railing or as a carpenter who can make a table but cannot make a window!

I consider myself as lucky breeder, because I can rely on a large farm laying close to the common lands and the mountainside. My goats have at hand all the pasture they need for 12 months a year. They graze the meadows in the winter and the forest in the warm season. This is a great advantage for us for us. Many people in the same business are forced to move two times a year from the valley to the mountains and back, to find appropriate pasture for their livestock.

Goat herding simply depends on the pasture. In this activity, everything is connected to feed, and the breeder must improve or develop the process. We are not better than those of Orgosolo or other part.

We use "Sucammu" as a safe weaning tool for kids. "Sucammu" is a piece of wood that we put in kid mouth. We put it on the tongue and tie it to the horns or at least the neck behind the ears. This wooden stick over the tongue, in kid mouth, allow the kid to graze and eat but doesn't allow him to suck the milk because the kid has this stick over the tongue will not suck. These are recommendations that we were told our parents because it is a basic form of safe weaning.

I have the humility to do my work as goatherd, in the correct possible way. Both the accommodation of the fold is important because, as I have already said, if goats consume a bale of hay it is better to put two in the winter because the heat is very important for both adult goats, and even more for young kids. The heat and health are important for goats, they should not lie down on damp hay, because they can take many diseases from moisture. The care of the fold is crucial in our job, and you cannot carry on this activity without proper skills.

For people in all kind of business there's always room for improvement, and the goat breeder is no exception. Every day can carry the opportunity to learn something new; something useful. However, I still remember the recommendations that were given to me from our parents, grandparents or our ancestors. I myself try to recommend them to my sons. They learn from my words and gestures, and then try to do the same, possibly faster than I do.

I can easily recognize the kid of one doe or another, without documentation.

The kid refuses to suck from every goat but the mother, and the goat would chase it away. The kid will keep looking for his mother in the pen until he finds the one, but we know it and we put them together immediately.

If the kid dies the goat has to be milked immediately, if not, it's becomes dry, you will ruin it.

The important thing is, when birthing kid, the goat milk is different for four days. We know that mammals have colostrum's milk which has a nurturing immune safer and it is more useful for life start of the animal. When the kid sucks that particular milk he gets natural protection. For two months the kid will eat only milk. The milk fulfills all the needs of the kid. After third month the teeth will be well out of the gums and the animal can start eating plants.

BREEDER B

Mr. Natalino Fadda narrative

Isoe, Orosei, Nuoro, Sardinia, Italy - 28.11.2012

My name is Fadda Natalino from Isoe, Orosei, Nuoro, Sardinia, Italy.

I started to work in this from as a goatherd five years ago. This is an ancient farm, but since I started to manage it, I had to rebuild everything from scratch. Our methods are deeply different from those of the ancestors. In old days the farm was hardly more than a wooden enclosure. Now we have buildings, sheds and equipment. The most part, ninety percent of our land is kept in its natural condition, with weeds, bushes, shrubs and trees. In few words: Mediterranean shrub lands. We do own also cultivable land, which is around two hectares.

Mainly goats feed on rough pasture in the meadows. We usually feed a varied diet: Mainly we use alfalfa and many kinds of cereals, legumes and concentrated fodder. Preferably we give cereals, beans, peas or maize. In the end of the summer we are facing to food shortage. Sometimes the drought lasts until October. Everything depends on the weather. During all summer and the first half of the autumn, when fresh pasture goes short, we give supplementary food. Otherwise, with plenty of graze, we give only an additional dose of cereals or concentrated feed.

Our goats belong to the Sarda breed. The goats graze all year around in the pasture. They stay in the stable during the night only when they have the kids.

Goats need feeding, watering and a cleaning systems "straw for bedding" in the stable. Especially for the kids, the main threat comes from predators. We must inspect frequently the enclosures,

because foxes are always trying to get into the stable and if they would succeed they could make carnage. And there are also the weasels and the martens.

We apply Family management system in the farm. I do everything by myself, by hand and sometimes my wife helps me. I use the catches “catture” and the feed to perform milking.

Normally the goats get pregnant once in a year. We prefer the natural insemination because being cheaper and safer. We select the goat that we esteem fit for reproduction. We select a good ram, which must be healthy and has well shaped “should be tall and solidly built”. The head and the body should be well proportioned. The doe too, should be well proportioned, and fit to the habitat. For example, the udder must be roundish and not too flabby, to prevent possible wounds inflicted by thorny brushes. When the does become sexually receptive, they begin to sneeze. Furthermore they mimic the coupling act, jumping onto each other and the vagina appears slightly reddened. The rams are the quickest to sense the estrus phase coming. They start to stir 10 days earlier than does. We use a good ram for mating 30 - 40 does. In my experience, the proper time for mating is between the months of June and July.

When it's near to birth kids, one can recognize from the shape of the belly. Also the udder becomes more swollen. It's somewhat common that our goats born twins. Some time up to 3 or 4.

We are rearing the goats to produce the milk, the kids and the meat.

When get birth the kids, our goats produce milk. The average rate is between 1 and 2litres per day. We cannot know the correct figures when the goat is feeding the kids, but after weaning the production settles between 1.5 and 2litres per day. It depends on feeding and, lesser important, on weather conditions. We are milking only manually. Normally we sell it all to a local cheese factory. With the milk they produce several kinds of cheese. Aside from cheese, we produce also “merca” (a semi-solid and slightly acid fresh cheese Ed.) and ricotta.

We use natural rennet. One can buy it ready to use. It's very practical. We don’t obtain rennin enzyme from the stomach of a kids, we have dismissed it. It's a pretty delicate task, because it

demands too much attention. Many decades ago it was the only known way to make cheese, with the stomach of the kids. I've seen this process myself and I still can perform it, but still I prefer to use the ready-to-use rennet. We uses simple equipments for cheese making, these are a large stainless steel pot, with a thick bottom; a gas burner, a long stainless steel spoon, to shuffle the mixture while processing, and a number of molds to keep the cheese at the end of the process.

I perform everything on my own. Occasionally my brother or my father can give me a hand, but usually I work on my own. Years ago my wife used to help me to perform milking, but now she doesn't do that anymore. Today she is watching the sheep herd.

Our goats produce hides, we sell goats hides but it can be processed, to obtain leather bags, pouches and other manufactured.

Goats, like other organisms suffer from disease. Over the past few years, we have been faced with outbreaks of various animal diseases. The most serious was the abortion in goats. The symptoms are pretty evident. Abortion occurs after the first month of pregnancy. You can recognize it from the blood stains on the tail. We can't do anything for remedy the abortion. The affected goats usually self immunize naturally, after few weeks.

We've faced many cases of mastitis. We can recognize two sorts of mastitis. There's the light one, from which the animal can heal completely. Sometimes onto the light mastitis can add up an infection; then the udder becomes violet and we call that “black mastitis”. Because of this, a goat can even die, but more often just stops producing milk.

When we want to verify milk's quality, we perform CMT (California Mastitis Test Ed.). We do that also when the milk looks completely normal.

If the sample processed with CMT shows slight precipitate or distinct gel formation, it proves that there is mastitis. In such case, even if it looks normal, the milk must be destroyed. The cause of mastitis can be a diet with too many proteins or even a fever.

If we saw in the herd that the goats lose weight, we thinking about nutrition, it will be a result of malnutrition. Otherwise it can be due to some diseases and Parasites, lose weight usually occurs along with other symptoms. We've faced cases of weight loss due to parasites.

If abnormal mucous secretion from the nose and the eyes of a goat, that can be caused by Pasteurellosis, but also these symptoms can be caused by lung parasites or liver parasites also. Otherwise when fever arises, the eyes appear abnormal.

We only use medical plants to treat goats disease is the use of desiccated stems of Ferula (Ferula communis Ed.) to immobilize bone fractures. All the works I do here, I've learned from my father. Everything in my job comes from firsthand experience. The professional skills of a shepherd are not taught in any school.

We have pretty low income in our business. I wouldn't talk about advantages, but just it is a way of survival. My goats create job and advantage for cooperatives wages. Then, when we need to buy medicines, we pay to the pharmacist.

My goats mainly graze or browse in the open pasture; uncultivated lots. They do not cause damages to cultivated land. Of course, also bushes and trees can suffer damages from the goats, but natural plants are usually more resilient. Besides, while eating, the goats lay their manure on the soil.

My favorite task is milking, because it's the moment when I get the very result of my work. But all in all I like also the rest. You cannot keep doing a job like this if you are not fond of it.

I always try to do my best, but I'm not the only one. I'm not saying that there are no differences at all between different breeders. There can be something in the fodder, in the available pasture, but I think that nobody of us can move too far from common standards. I can point out a difference in the milking task, since I perform it manually, while the others use the milking machine.

BREEDER C

Mr. Cossu Giovanni narrative

Nuoro, Sardegna, Italy - 04.12.2012

My name is Salvatore Carta. I live in Dorgali, a municipality in the Province of Nuoro, Sardinia region, Italy.

I belong to the fifth generation of a family of goat breeders. I have been working with my parents since I was a child. I work now with my two sons (like many people in the same business, Mr. Cossu learned goat herding from his ancestors and his progeny is expected to learn the same occupation from him). When my parents started to work here, it was a natural forest mountain side, within a vast uncultivated forest area. Over time we converted some parts of it to cultivated land.

At first there were more trees, natural trees. We had to cut down some of them, to be able to plow at least a few hectares, so to start our own cultivation of crops and fodder. Here we have approximately 140 hectares of land, with about 40 hectares in cultivation (of typical farm ground). The rest is native pasture and woodland.

The cultivated area has very fertile soil (also known as river bottom or kick bottom ground). We can cultivate wheat, barley, maize, corns, oats, alfalfa and clovers every year. We are doing inter-cropping (Legumes into gramineae), to produce high value nutrient forage. We perform rotation to keep the land clean from weeds and to conserve land fertility.

Goats graze all year round in the pasture. They graze at different seasons in different places, From January 20 until February 20, goats graze into sowing grassland. Later during summer they go deeper to graze into the forest or in the mountains, and then they search cooler places because

the heat is the first cause of diseases. At the beginning of autumn, after early rains, the grass starts growing again. Goats graze on fresh herbs in the smooth, cleaner and more comfortable lands. In the winter goats feed on drought forage which is harvested from the cultivated area.

During food shortage (August, September and October), goats feed on a little concentrate too. Supplementary food "concentrate" is necessary for increasing animal's productivity and to help during food shortage. In addition to feeding, the goats need a clean stable. We place hay on the floor in the stable, to keep it comfortable and dry. It is an important instrument for the goats health to keep them safe from wet and fungus infection.

We are rearing Sarda breed or RusticaSarda because it is adapted for these mountainous areas and it is suitable for this kind of pasture. It is a local intensive goat rearing system, which is managed by family members. All material and tools are simple and made by natural sources such as wood. In the stable, we keep separate places mothers with kids from adult livestock. Possible ill or infected animals are isolated from the others until complete healing.

We try to select young female goats which have a genetically softer udder rather than hard. That will take time, as soon as we follow selection to raise the flock from these goats. The two most important products of our goats are the kids and milk.

The Sarda goat can reproduce twice a year, but we prefer one time a year because in this way, goats will have a longer milk production period: around eight months. Milk is our most important source of income.

We perform only natural insemination, because it is natural, economic, simple, and convenient and it is easy to manage kidding. One buck is capable to fertilize thirty to forty goats on average. A medium, healthy, strong, normal feature and enough robust Sarda buck is good for reproduction.

The doe which is has been selected for reproduction should be healthy, strong and mature (at least have 10-12 months old) with a softer udder. Buck capacity, to inseminate the does at natural insemination, is related to age, genus, nutrient and climate, so it varies from 20-60 goats. (The number of females that a ram can successfully breed in a given time depends upon the intended use, age and experience of the ram. Young, inexperienced males are not able to fertilize as many females as older more experienced males do.)

We observe some signals to recognize the proper time for insemination. The milk production lowers, body temperature rises, and the does start jumping over each other, often bleating. (Common signs of estrus include tail wagging, receptivity to and actively seeking bucks, mounting and bleating. Singh-Knights and Knights, 2005).

From the copulation with the ram, I can start measure the gestation period of the doe. The most evident sign is the increasing volume of the belly. Eventually the udder cells (milk glands) start to produce milk. Due to the extra weight, every movement, even walking, seems to be more tiring for the goat. Also the udder is a good indicator too because, before kid birth, it becomes full of milk.

Goats frequently can deliver more than one kid. Actually we have a high rate of twin pregnancies. We can easily know if the goat is carrying more than one kid, long before the birth. We touch the belly, especially in the morning, because at night the pregnant goats stay closed into the pen, without grazing, so in the morning their stomach is empty and it's easier for the breeder to touch the belly and to recognize the skulls of the fetuses. I have been doing this job since I was a baby, from 11 -12 years old. Experience is crucial, we can often tell the number of the kids just watching the way a goat walks, we don’t need to touch it.

Other products in addition to kids which we are producing in this farm are milk, meat, wool, hides and manure.

The lactation period of our goats is about 7-8 months. Sarda goat produces one liter or one and half liter per day, for around 5-6 months, then it falls down. The first month after kidding the Sarda goat produces on average of one liter. When spring starts, the growth of fresh grass increases, this should increase also the milk production, that keeps this rate for all the summer. So the lactation rate is like an arc that goes uphill and then comes down.

Milking is a team work; we do it twice a day (in the morning and in the evening). In the morning, the first thing we do together and as fast as possible is milking. In the past, our parents or grandparents used to transform the milk in cheese, here at the farm. They used to sell the cheese, but the trading business was somehow uncertain and so were the related income. Now we sell almost the whole milk production to e Dorgali Cooperative: it's like earning a salary every month. For this reason I can feel economically safe.

Cheese makers put rennet for fermentation. They produce cheese and from serum which residue from this process makes ricotta (cottage cheese), it is a byproduct of the cheese.

Before having this kind of rennet they sell nowadays, we used to extract the rennin enzyme from the kid abomasum. When we slaughtered a kid, and we took the enzymes from its abomasum, we used to dry it. Kid rennet is different from that of other ruminants, because it contains the strongest enzymes. This enzymes are useful for fermentation. The dried enzymes were kept it the refrigerator. During the cheese-making process, the milk was heated into a large metal pot, then the enzymes were added and mixed into it to start the fermentation.

We use simple tools for processing milk, like a large wooden spoon, a cauldron, the forms, a cooking stove. We use also a drying chamber and brine solution so that cheese can age without getting mold.

I have two sons that work with me in the farm. We milk goats together because milking must be performed quickly, so that we can start cheese-making process as early as possible. Those who work in the farm must be familiar with these three main tasks: milking, cheese-making and

cheese care along aging process. If one of us is busy with other matters, the others would perform all the steps on their own.

Our goats, have a pretty solid, durable and smooth skin. It is thin but resistant, naturally protected with soft warm fur. Nowadays we don't handcraft anymore goat hides: we just sell them to a broker. In ancient times, from the hides, they made bottles and bags, to carry the goatherd daily needs. At dawn the goatherd used to pack a bit of bread, a bit of cheese, a slice of bacon into this kind of leather bag, and that would fulfill his needs for a whole day in the countryside, along the flock. Beside that, many other items were realized in old times: saddlebags, shoes, belts and overcoats were made from goat skin.

The goat's wool was used too, and it was greatly appreciated. The goats were sheared during the springtime. From the ones who had thicker hair was obtained a special fabric, used to make "sa bertula". This is a traditional double bag, very versatile, apt to be carried horseback or worn over a man's shoulder. It was suitable to carry clothing, personal supplies, equipment, as good as fodder to feed the donkey, or livestock kids.

The meat of goats is very good to eat. It has a different flavor and taste because goat feed is different from the sheep's. Goat eats over the grass, shrubs or branches. So goat meat is more tasty and fragrant.

Goats are a living organism; diseases can be life threatening for them. But nowadays a goat can die from gastritis, or even from over-nutrition but they do not die anymore for epidemics. Forty or fifty years ago the very serious diseases of the goat were eradicated by vaccines, as “Foot-and-mouth disease” and “Anthrax”. Both of them could cause a carnage in the herds until the 50s. Our goat, Sarda goat, is a strong animal, pretty resistant to diseases. Only two kind of problems can arise, diarrhea and gastritis. We solve other problems by vaccination. We do maximum two times a year and cover throughout the year.

In everyday activity, we are attentive to the livestock condition. Several issues can affect the udder, caused by a disease or by wrong eating: mastitis, rupture of udder veins, rupture of

capillaries. Sometimes, if the goat eats poisonous herbs, that can ruin the milk. It will be yellow instead of white. If we observe a change in the color of milk (red or yellow) we stop milking immediately. The deteriorated milk must be kept apart from the good one, and must be destroyed as son as possible.

Another possible symptom of disease is the loss of weight. If a goat loses weight it may be: under-nutrition due to lack of appetite, or some kind of poisoning or some disease, or marching for too long a time, or weather change. Kid weight loss depends in mother milk, so a kid can lose weight when the mother feeds him deteriorated milk.

Mucus leaking from the nose of the goat can be caused in winter by grazing frozen pasture. So in truly cold days its better not to free the goats from the enclosure early in the morning, to avoid grazing frozen vegetables. In such cases we prefer to free the goats outside around eleven or at noon, when the pasture has been warmed an dried by the sun. Goats are capable to feed fast and grazing in a hurry. Three or four hours are enough for goats to feed.

Occasionally we use some healing plants to cure livestock illness. One of those we name “Crammediu” and we use it to heal wounds. It must be boiled and distilled and then stored in a bottle. At high concentration it's effective for injuries, it helps to heal wounds. At lower concentration rate it is useful by enteric administration to fight parasites.

Also hard liquor, a distilled beverage, is used to expel worms. There is this parasite, named the "tapeworm" that attacks the intestine. We can make the goat expel the “tapeworm” just feeding a little dose of liquor: half a glass of it, for two or three days in line. The liquor makes the goat expel the tapeworms and cleanses the intestines. They are simple medicines, our grandparents told us.

We have herded goats for many years from now, like our grandparents did, mainly to survive. Goats were preferred to the sheep because the land was not cultivated as it is nowadays. When Barbagia was covered by bushes an forests, it was perfect to breed goats, while the sheep could hardly survive. Today we have plenty of cultivated farmland, but there is still the mountain, with

its wild vegetation, always good for goats. And now we have one more reason to keep breeding them: it's a new project that involves also my sons.

We are trying to realize a working both zootechnical and didactical farm. A place fit to show to young people and to students the way we manage our livestock. In this respect goats are very important, because goat herding is somehow declining. There are far more dairy and sheep farmers than goat breeders.

So the new generations, like the children from the primary schools and beyond, could come to visit the farm, to learn about the animals we breed and to study an ancient activity that can still offer professional opportunities to future generations.

If this project succeeds, this could be an additional source of incomings for my family, besides the kids, the milk and the goat meat.

We don't have an irrigation system. We basically depend on the weather. The land naturally is good now, because in the autumn it has rained enough and we can plow. But we must do it as soon as possible; say within 15 or 20 days. Otherwise the soil could become hard and arid, and the plowing task would become more difficult. This represents an additional load of hard work. In such cases we usually hire seasonal workers, equipped with their own machinery.

When the forage is growing, the goats must be kept apart, otherwise we would have no forage at all. We let them graze on the grassland until February, then we take them into the forest or into the bushes. Barbagia, our area, here around, is rich in vegetation of Holm oak. Goats live in symbiosis with forest. They like to choose their favorite plants, the shoots and the most sweet acorns. They are smart animals, and intelligent too. It's pretty interesting to see how they choose their favorite oaks, the ones with the sweetest acorns.

Lanaitto is a bed of a river. The limestone, over the centuries has produced and formed this valley and the layers of the land are excellent in providing adequate pasture for the goat.

So, the forest is rich in plants humus, in wood from tree rotting, in leaves. This territory is very good for grass growth and development. It is unlike of the basalt land, of a highland which has a very thin layer of soil and the grass grows in reduced form. In a highland rarely find forests of "Holm". We can find a little "'Olivastro", we can find a little "Lentischio". Instead here, thanks to God, the limestone terrain offers much, much more because it is formed in a different way.

I know than a breeder can do everything in the farm on his own: I do know people like that. But I prefer to work in team, because at the same time I can carry on the job and show what I'm doing to somebody else. Learning experiences and techniques from each other can increase production. One breeder must be able to do all three things, the management of goats, milking and transformation, they are all part of this job.

A breeder cannot specialize only on one task. It's like a blacksmith who only knows to make blades and don't know to make a railing or as a carpenter who can make a table but cannot make a window!

I consider myself as lucky breeder, because I can rely on a large farm laying close to the common lands and the mountainside. My goats have at hand all the pasture they need for 12 months a year. They graze the meadows in the winter and the forest in the warm season. This is a great advantage for us for us. Many people in the same business are forced to move two times a year from the valley to the mountains and back, to find appropriate pasture for their livestock.

Goat herding simply depends on the pasture. In this activity, everything is connected to feed, and the breeder must improve or develop the process. We are not better than those of Orgosolo or other part.

We use "Sucammu" as a safe weaning tool for kids. "Sucammu" is a piece of wood that we put in kid mouth. We put it on the tongue and tie it to the horns or at least the neck behind the ears. This wooden stick over the tongue, in kid mouth, allow the kid to graze and eat but doesn't allow him to suck the milk because the kid has this stick over the tongue will not suck. These are recommendations that we were told our parents because it is a basic form of safe weaning.

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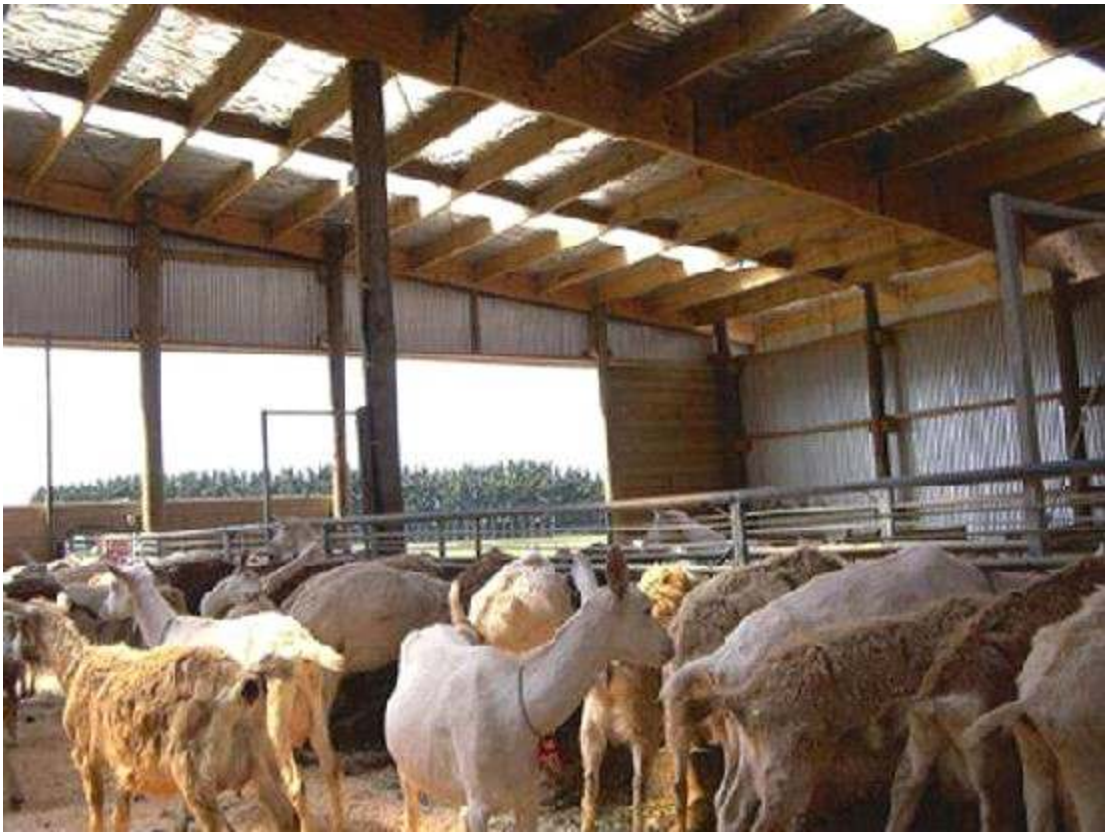
ANNEX III

PHOTO ELICITATION

Abdullah Halim
Discovering and Resolving Value, Goat Breeders' Local Knowledge in Sardinia
Scuola di dottorato di ricerca in Scienze e Biotecnologie dei Sistemi Agrari e Forestali e delle Produzioni Alimentari, Università degli Studi di Sassari



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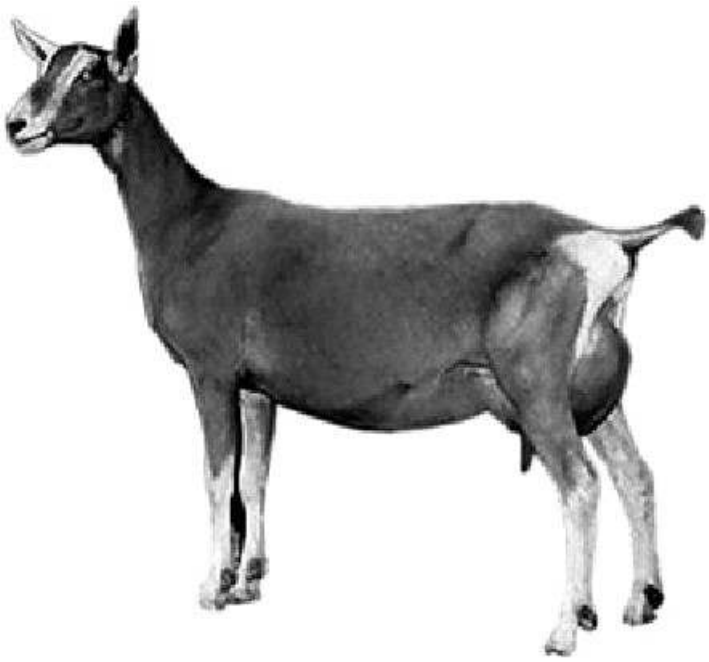

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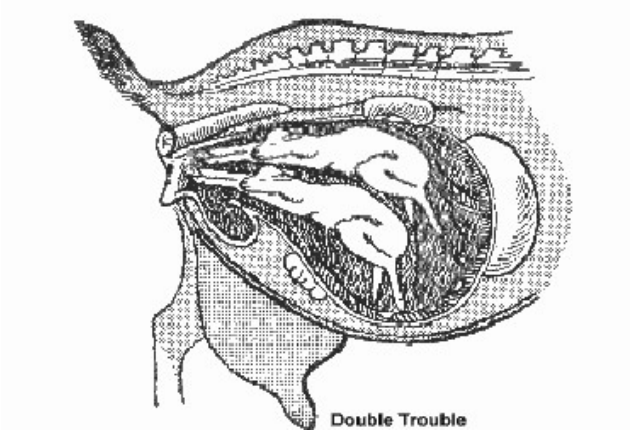

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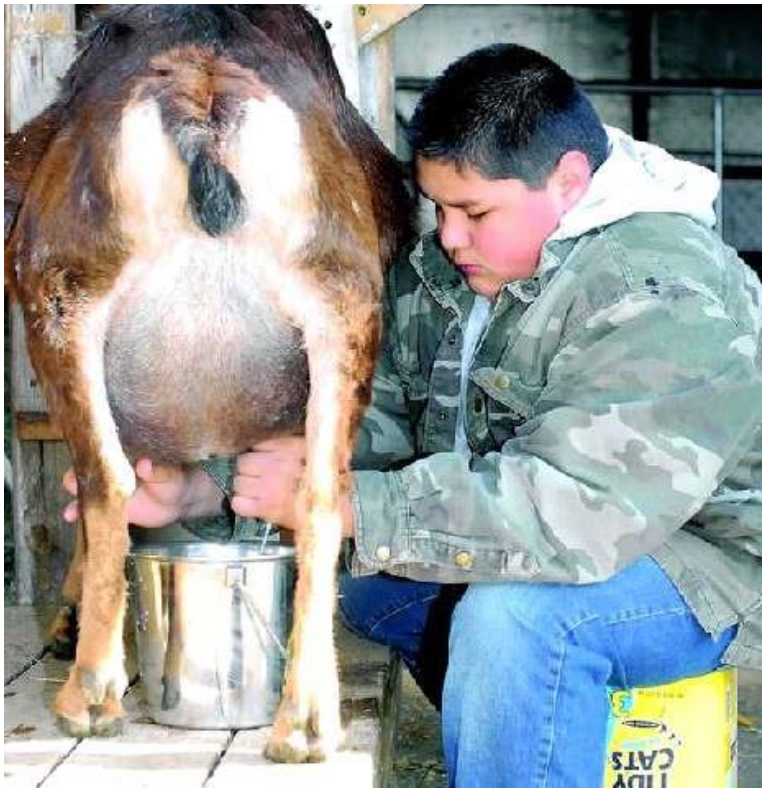

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Are You Sensitive?
See Side Panel
GOAT
MILK

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