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PAPESHE

Deliverable 5.1.1 Training programme for sheep farmers

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Key information

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Information about this publication

This trainer guide is designed to facilitate the training of sheep produces for improved sheep production and marketing with special focus on the sustainable exploitation and protection of the existing populations of the Florina-Pelagonia sheep breed which nowadays faces the danger of extinction.

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Contents

Current issues in sheep production - Purpose of the training

Sheep farming constitutes a very important economic activity in Balkan countries and in Greece. The sector is recognized as the predominant amongst other livestock sectors with remarkable tradition in many countries. However, the political changes and the technological advances developed over the recent years have affected - as expected the sector, both in terms of farming practices, but also in terms of breeding, changing gradually the genetic composition of the traditional sheep flocks and causing some concerns about the decline in the population of autochthonous sheep breeds.

The main factors responsible for the constant reduction of the population of the indigenous breeds of sheep can be sought at the frequent and often unjustified, replacement of the purebred indigenous animals with imported ones (also known as "improved breeds"), and at the

unselective and frequent accidental mattings that occur between animals of different breeds (or genotypes) within a flock. Indeed, in attempt to increase profit, many farmers instead of improving and developing further their farming system by exploitation of the existing genetic resources, rather choose to replace indigenous purebred animals with imported breeds solely based on the capacity of these breeds for high production. In addition, for many years farmers allow uncontrolled and unplanned mattings in their flocks and do not apply selected reproductive schemes to improve production traits while any national attempt towards this direction was not implemented properly. Under these practices, standard morphological and productive characteristics of certain breeds have faded, resulting in population of sheep of various characteristics that cannot be classified in certain breeds. Thus, population levels of the indigenous sheep breeds have been declining for many decades leading them to their extinction, while some others are already extinct.

Today, sheep farmers mainly breed crossbred animals in extensive or semi-extensive farming systems, pronominally for milk production. Many of these farms share common problems such as insufficient control of diseases, absence of reproductive management and genetic improvement programs, irrational exploitation of natural pastures, poor feeding management, absence of waste management policy and generally lack of business plan.

It is generally recognized that the majority of the farmers today although it is skilled to some extent to perform husbandry practices, fails to understand and implement certain advises, directions and management plans that are provided by advisors and experts. Modern animal husbandry requires farmers to be professionals with high levels of expertise able to recognize and comprehend the advice and knowledge given to them by advisors but also capable of judging and making their own decisions and initiations. Farmers should build on existing practices and knowledge that are proved to result in desirable outcomes, improve their abilities and skills further so as to carry out certain animal husbandries that require some level of expertise (e.g. artificial insemination), and familiarise themselves with technology that can help them increase the efficiency of their farming system. Farmers should have a holistic approach when it comes to the management of their farms and should learn to avoid unsustainable practices that affect negatively the performance of their farms and the surrounding environment. It is therefore

essential to train farmers and help them build certain skills and provide them with appropriate knowledge in order to achieve high standards of animal productivity, ensuring optimal animal health and welfare.

This trainer guide aims to assist farmers understand and improve their skills but also build new skills and develop certain abilities focusing on:

- Optimal exploitation of existing facilities of the farm, identification of problems (needs - requirements), possible solutions, understand pros and cons of the implementation of modern technology.
- Understand the importance of animal identification, compliance with EU rules, appropriate marking techniques e.t.c.
- Livestock health management and disease prevention
- Implementation of animal nutrition management based on the stage of production, age, e.t.c. and pasture management
- Understand the importance of implementing reproductive management and ability to recognise and appraise reproductive indicators.
- Ability to implement reproductive management and development of skills such as synchronization of estrus and artificial insemination
- Understand key aspects of genetic improvement
- Develop certain skills related to good animal husbandry (i.e. care of newborns and the ewe, milking practices, detection of animals with mastitis)
- Understand and recognise factors that affect product quality i.e. organoleptic characteristics of products, carcass conformation and more
- Proper management of farm waste, by-products and residues of livestock
- Insight on information and communication technologies

- Access new business opportunities in a competitive international environment and to be informed about new advances in livestock production

Implementation plan for the training

Given that the training program is aimed primarily at sheep farmers that breed indigenous breeds, it has been designed in a way that the thematic sessions are linked to the importance of rare breeds for the modern livestock production and how good management practices can be implemented in order to ensure animal welfare and enhanced farm productivity.

A specialized seminar based on empirical learning will take place and will be aimed at the graduates of last year's seminar; the seminar will focus on genetic improvement, animal health, pasture evaluation and pasture management, diet formulation and principles for selection of mechanical equipment.

A holistic approach to learning will be used primarily based on empirical learning that will allow participates to learn through reflection, feedback and application of skills and ideas. It order to achieve this and ensure high standard of knowledge exchange the training involves both theoretical and practical sessions and will be addressed to farmers aged from 18 to 65 years; farmers will be divided into groups of 15 ensuing equal age distribution into groups in order to facilitate and encourage interactions amongst them. An outline of the training program is provided in Appendix A.

The training programme will be administrated within a period of 4 months and will involve a total of 48 to 54 hours of training. It is designed in a way that the training modules are linked to the annual productive cycle of the livestock farms and to the specific challenges they face at each production stage. The training programme will last in total of 90 hours and is consisted of:

A. Theoretical training

The theoretical training will cover key aspects related to sheep production such as the importance of rare breeds, basics of good husbandry practices and farm management, introduction into farm accounting and economical aspects. Specifically, the theoretical training

involves a total of 48 hours under which the following thematic areas will be covered i) principles of sheep farm management in holistic approach, ii) reproductive management of sheep flocks, iii) implementation of genetic improvement programs iv) principles of sheep nutrition, v) animal health, welfare and hygiene, and vi) factors affecting product quality and the organoleptic characteristics of products.

B. Practical training

Practical training involves a total of 42 hours. Under this selected visits to sheep farms will take place that will allow farmers to learn through demonstration and interaction with other farmers. Group discussions will be encouraged and facilitated by an experts (i.e. advisors and scientists). Farmers will also have the opportunity to share ideas, interact and benefit from other farmers experience.

Upon completion of the training, participating farmers will be able to:

- Understand, demonstrate and invoke change in approaches to sheep reproduction, management, housing, feeding and healthcare.
- They will adopt improved techniques for small ruminant production.
- Will be knowledgeable in the importance and role of animal-sourced food (meat and dairy) in human diets.
- Will be better positioned to improve family health and nutrition through better feeding practices and increased production from their own flocks.

Session 1: Why rare breeds are important.

The first topic refers to the importance of rare breeds. The duration of the topic will be a total of 12 hours including the field training at the farms (6 hours). Since we are training farmers of rare breeds, an extensive reference should be made to the characteristics of rare breeds and in particular should include:

a. The Study of the special characteristics of rare breeds of sheep: The native breeds of farm animals and together with them the sheep of Florina - Pelagonia, are the result of long-term of both natural and artificial selection. Centuries of selective breeding in a generally adverse environment gave them unique characteristics such as: resistance to disease, resistance to adverse and changing weather conditions, ability to utilize poor pastures, etc. The main feature of the indigenous breeds of farm animals was the ability to adapt to a wide range of climatic conditions and ecosystems, which accompanied our ancestors for centuries, providing them with the necessary food.

b. The need to preserve indigenous genetic material in the context of biodiversity, in addition to its importance for our cultural heritage, also provides us with the opportunity to select the appropriate breeds and develop new types that will respond to ever-changing climatic conditions, new human nutritional requirements and in general the needs of the market and our society. Until recently, our inaction in the face of the danger of the extinction of indigenous genetic resources, unfortunately, was a sign of disrespect for both previous and future generations.

The inefficient development strategy of sheep and goats breeding, which was based on crossbreeding with imported breeds, resulted in the alteration of the genetic composition of the Greek flocks with controversial results.

d. The need to preserve the indigenous tribes. The international community, recognizing the need to safeguard the genetic resources of farm animals, adopted the first in Global Action Plan referring to their preservation. This project, signed by 109 countries, including Greece, aims to address the disintegration of genetic diversity of farm animals and their sustainable use. Particular emphasis should be placed on national breeding programs for rare breeds and financial incentives for farmers.

Reference to the morphological characteristics of the sheep of the Florina breed with special reference to the colouring, the characteristics of the head, the neck, the body, the tail, the breast, the wool etc. Also reference to the characteristics in milk production, wool production etc.

In summary, the educational module includes:

- Study of the special characteristics of rare breeds

- The need to preserve genetic material in the context of biodiversity
- The need to preserve indigenous breeds
- The causes that led to the extinction of the indigenous breeds
- National programs for the conservation of rare breeds
- Study of the characteristics of the sheep of the Florina breed.

Expected outcome

By the end of this Session farmers will be able to understand and recognise the special characteristics of the rare breeds. Will understand the need to enhance biodiversity and the importance of their preservation for implementing genetic improvement regimes in an attempt to increase their productivity and secure their population from extinction.

Session 2: Livestock Farm Management - Basic Principles of Sheep Nutrition

The 2nd Session includes a total of 6 hours of theoretical training and 6 hours of training in livestock farms. The Session covers aspects of management of the livestock farms with emphasis on nutritional management.

Under this Session the principles of sheep nutrition are presented and discussed. Farmers should understand that nutrition plays an important role in the overall productivity, health and proper functioning of each sheep farm. The Session covers key aspects on grazing management, nutritional value of pastures and estimation of pasture productivity, calculation of stocking rates and grazing management. Characteristics of feeds and feedstuffs are presented and discussed as well as the principles of diet formulation based on animals' nutritional requirements in view of production stage and performance. Farmers should understand how to meet the nutritional needs of their flock and the importance of drinking water, energy, protein, minerals for animal productivity.

This topic also analyses the nutritional needs in nutrients in the various production phases of the animals (maintenance, gestation and milk production), instructions for the feeding of lambs and rams, as well as general feeding principles of sheep farms and instructions for preparing rations.

Expected outcome

By the end of this session, participants a) will be able to understand sheep feeding habits, identify their most liked feed types, and understand preferred sheep feeding practices, b) will acquire knowledge in sheep feed requirements during the different stages in the animal's productive cycle, c) will be able to develop improved forage in their compounds and farm boundaries, make use of crop by-products such as maize stovers and bran as animal feed, and skilled in feed preserving methods such as hay, stray, and silage making.

Session 3: Reproductive Management

The purpose of the session is to educate farmers in the reproductive management of sheep farms. The theoretical training includes a total of 12 hours and covers the following aspects i) reproductive system of the male and the female, ii) physiology of sheep reproduction i.e. estrous cycle, heat detection iii) estrus synchronization with hormone treatment and with natural methods (i.e. flushing, ram effect), iv) key information about semen collection, packaging, freezing and storage and v) principles of artificial insemination.

Modern techniques in the field of reproduction and the effect of reproduction on the economics of sheep farming require extensive reference to the process of artificial insemination, which is applied to sheep with fresh sperm, mainly in large-scale genetic improvement programs. One of the main advantages of artificial insemination is that it allows the complete control of the breeding and accelerates the genetic improvement as well as preventing the spread of diseases that are transmitted through natural mating.

In addition, the number of rams required in a breeding is reduced while the use of animals of high genetic value leads to the immediate genetic improvement of the population at a rapid rate, easily and economically, while allowing pedigree control. Breeding management is a key skill for farmers. In addition to the economic effects, the use of animals of high genetic value leads to the

immediate genetic improvement of the population at a rapid rate, easily and economically, while allowing for pedigree control. It allows the fertilization of ewes in remote areas, with male animals of high pedigree value and from a semen from superior o genetic value a large number of lambs is achieved (1500 lambs). At the same time, the work and expenses of keeping rams that do not pass desirable characteristics to the lams are avoided.

Expected outcome

By the end of this session trainees will be

- able to describe important cycles of sheep reproduction, including selection of breeding stock, mating practices, gestation and birthing, and care of newborn animals
- knowledgeable in the causes of reproductive failures and capable to take corrective measures and
- able to identify the different stages of parturition, normal-abnormal presentations and be skillful on lambing preparation and how to assist delivery.

Session 4: Animal Genetic Improvement

This Session includes a total of 6 hours of theoretical training and 6 hours in field training on livestock farms. Reference is made to the orthological implementation of genetic improvement programs and the need to establish kinships between the herds that will participate in the Program through Artificial Insemination or exchange of rams for the purpose of unbiased genetic evaluation of the animals participating to the program.

The key elements of this session are:

1. The identification and recording of the individual details of the animals in the breeding holdings
2. The formulation of accurate genealogical books of the breed with the correct keeping of genealogical data, the keeping and updating of breeding registers

3. The continuous control of production yields with accurate and uninterrupted yield recordings
4. The transfer and introduction of data into databases and
5. The processing of that data, the assessment of the breeding capacity of animals through the assessment of the inheritance values (genetic values) of animals and the issuance of certificates of genealogy of animals.

The practical element of the Session includes field training on the holdings, emphasizing on the identification and recording of the individual data of the animals and the accurate keeping of the genealogical books.

Expected outcome

With the implementation of genetic improvement programs, the potential benefits that a sheep breeder will receive are a) increased production, b) reduced production costs and c) the production of certified breeding animals with high added value. Genetic Improvement is an investment that long term pays off.

Session 5: Sheep flock Health and Welfare

Session 5 includes 6 hours of theoretical training and 6 hours of field training on livestock farms. The basic principles of the theoretical training of this educational topic are: i) management of farm facilities and the importance of special pens for animal welfare and hygiene (i.e. lambing pens, pens for sick animals etc) ii) disinfectant mats or wheel baths as precaution measure to limit disease spread in farms iii) basic equipment and elements of the milking parlour area and parlour space availability iv) principles of milking machine function and proper maintenance and cleaning and v) principles of best milking practices. Of great importance is the training of staff on animal welfare with special focus on management and care of the milking ewes and newborn lambs, on nutritional status of animals, on animal vaccination and anthelminthic treatment ofthe animals for the protection from exoparasites and endoparasites, foot rot and /or other infectious

diseases. The session also covers aspects related to animal transportation according to the current regulation, with appropriate means of transport ensuring the least possible stress implemented.

Expected outcome:

At the end of this session trainees will

- Be able to understand the importance of keeping animal under a shade and skilled on how to construct sheep and goat house from a local material
- Be aware of basic sheep and goat house facilities of feeding trough and watering trough and enabled to prepare from locally available materials.
- understand the importance of improved housing and herd management in the prevention and control of sheep diseases
- be able to characterize sick versus healthy animals and make tentative diagnosis for the locally common diseases
- recognize the importance of animal vaccination in preventing the outbreak of the disease and/or treating sick animals early.

Session 6: Economics of Sheep Farming

This Session includes 6 hours of theoretical training. Reference is made to financial results such as gross income, production costs, net profit, labour income, and return on capital, agricultural income and gross income.

The topic includes the income improvement of the sheep farms which could be achieved through the genetic improvement, the increase of the productivity, the utilization of the meat production (which can be a profitable alternative for the producer), and the branding connection of the dairy products with the origin, the sheep breed and its special qualitative characteristics.

Reference is made to the reduction of production costs, which includes the selection of an appropriate breeding system (rare breeds are usually bred with an alternative semi-extensive breeding model) so that the animals can make use of the natural pastures and do not require high investments for their sustainable breeding in economic crisis conditions.

Potential outcome

By the end of this session, participants will

- Understand that sheep and goat production is a business and necessitates analysis of production, marketing and financial issues.
- Be able to complete a cost benefit analysis for their own production systems.
- Set minimum selling price for livestock sales.

More information about the project

Papeshe.vet.auth.gr

https://www.facebook.com/Papesheproject

Evaluation of the program

The evaluation of the program will be carried out by the trainees in 2 different phases: the first evaluation will take place immediately after the end of the training program and the second one within 12-24 months after that. The evaluation questionnaires are provided in Appendixes B and C below:

Appendix A: Outline of the Training Programme

SESSION	Theoretical training (h)	Practical training (h)
1. Importance of rare breeds	6	6
2. Farm Management - Basic principles of Animal Nutrition	6	6
3. Reproduction management	12	12
4. Genetic improvement	6	6
5. Basic principles of animal health and welfare	6	6
6. Economics of sheep farming	6	6
Program evaluation	6	
Total hours of training programme	48	42

Appendix B: Program evaluation questionnaire (phase 1)

Program evaluation questionnaire
Face A
Trainees

1. Gender:

Male ☐

Female ☐

2. Age: ☐

3. Education level

Primary school ☐

Lower secondary education ☐

Upper secondary education ☐

Tertiary education ☐

Tertiary education 2nd stage (i.e. PhD) ☐

4. Family status:

Single ☐

Married ☐

Evaluate the study program in relation with the following goals of the program.

1. At which level has the program met the expectations you might had when you enrolled?

Very good ☐

Good ☐

Basic ☐

Not at all ☐

2. How satisfied are you by the set up and coordination of this educational program?

Very satisfied	☐
Satisfied	☐
Not much satisfied	☐
Not at all	☐

3. To what extent did the content of the training program you attended meet your needs for acquiring knowledge and skills?

Very good	☐
Good	☐
Basic	☐
Not at all	☐

4. To what extent do you think you can use the knowledge gained from this training program?

High extent	☐
To some extent	☐
Not much	☐
Not at all	☐

Appendix C: Program evaluation questionnaire (phase 2)

Program evaluation questionnaire
Face B
Trainees

Farm identification code:	
Area:	
Number of animals	
Breed	

Yield increase:

YES	
NO	

Animal health improvement:

YES	
NO	

Established purebred flock:

YES	
NO	

Reduction of feeding cost:

YES	
NO	