

# The Romanian Tsigai sheep breed, their potential and the challenges for research

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## Abstract

With 24.3 % of all sheep, the Tsigai is the second most important sheep breed in Romania. Nevertheless, until 1989 it was mainly kept for wool production as well as milk and meat. Since 1989, the number of Tsigai sheep has decreased by 44 % to 2.1 million head. The reason is the loss of profitability of wool production. Nowadays, lamb and milk are the most important products.

In an empirical study carried out in 2011, it was found that 77 % of the sheep farmers in the traditional Tsigai sheep region plan to continue to improve the genetic performance and the number of heads of the sheep herds by breeding with East Friesian milk sheep (for milk) and Suffolk (for meat). Due to this trend, the number of traditional Tsigai sheep is still decreasing and the Tsigai is in danger of becoming a rare breed.

Together with the sheep farmers and the farmers' associations, the future goals of the research by the national Tsigai Research Station in Reghin were identified and the focus of the work defined. It was decided to preserve the Tsigai sheep breed with the development of new functions (landscape management), the use of added values in marketing (endangered local breed) and premium products (organic). This will be the future focus of the Tsigai Research Station in Reghin.

**Keywords:** *Tsigai sheep breed, milk, meat, research, Romania, Organic Farming*

## Zusammenfassung

### Die rumänische Schafrasse Tsigai, ihr Potenzial und die Herausforderungen für die Forschung

Das einheimische Tsigai-Schaf ist die zweithäufigste Schafrasse in Rumänien. Ihr Anteil beträgt 24,3 % aller Schafe in dem Land. Bis 1989 wurde das Tsigai-Schaf vor allem für die Erzeugung von Wolle gehalten, Milch und Fleisch waren Nebenprodukte. Seit 1989 ist die Anzahl an Tsigai-Schafen aber um 44 % auf ca. 2,1 Millionen Mutterschafe zurückgegangen, da Wolle an Wert verloren hat. Die Lammfleisch- und Milchproduktion sind heutzutage die wichtigsten Produkte, die Wollproduktion ist praktisch bedeutungslos geworden.

In einer empirischen Studie wurde 2011 festgestellt, dass 77 % der befragten Schafhalter in der traditionellen Region der Tsigai-Schafe beabsichtigen, ihre Herden mit neuer Genetik (Ostfriesisches Milchschaaf für Milch, Suffolk für Fleisch) umzuzüchten und dabei auch zu vergrößern. Damit besteht die Gefahr, dass die traditionelle Rasse im Bestand weiter abnimmt und gefährdet wird.

Unter Beteiligung der Schäfer und der Interessenverbände wurden deswegen für die staatliche Tsigai-Schaf-Forschungsstation Reghin zukünftige Ziele identifiziert und die Schwerpunkte der Arbeit definiert. Es wurde festgelegt, dass für die Erhaltung der Tsigai-Schafrasse wirtschaftliche Haltungsverfahren insbesondere durch neue Funktionen (Kulturlandschaftspflege), Nutzung von added values (gefährdete Rasse) und in der Premiumproduktion (Ökologisch) zu entwickeln sind. Hieran arbeitet zukünftig die Forschungsstation in Reghin.

**Schlüsselwörter:** *Tsigai-Schaf, Milch, Fleisch, Forschung, Rumänien, Ökologischer Landbau*

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## 1 Introduction

Sheep keeping was, is and will continue to be important part of Romanian agriculture. About 20 % of the country's land areas and about 30 % of Romanian agricultural areas are covered by permanent pasture (about 5 million ha) (Maruşca, 2011). This area, other marginal land and marginal agricultural products can feed 12 to 16 million sheep. Today less than nine million sheep are kept in Romania. Moreover in Romania there is still a great tradition of and experience with sheep production with adapted local and multi-purpose breeds.

Sheep-raising became unprofitable in Romania due to the wool capitalization at an extremely low price. The profitability of the sheep husbandry is difficult in the precarious socio-economic conditions characteristic for the transition period to the market economy where wool recovery is showing difficulties, (Mierliţă, 2001).

State support for this sector is almost non-existent, which led the sheep breeders to seek solutions to make their own farms profitable. Given the demand for mutton meat at both the national level and the foreign market, sheep breeders have resorted to crossing local breeds and imported sheep breeds for meat production.

The Tsigai sheep is the second most important sheep breed in Romania with 24.3 % of the national sheep herds (the first is the Turcana sheep with 52.4 %). Tsigai breeds are kept extensively in mountainous and sub-mountainous regions with large pasture areas. Like Turcana, Tsigai sheep is a multi-purpose breed with focus on cheese production. Lamb production has become of more interest in the last years due export opportunities in the EU. The article focuses on the Tsigai sheep breed because the risk of losing the Tsigai pure breed due to cross-breeding practices has become observable in the last years.

Having to face the Twentieth Century challenge to change from and to the market economy, Romanian sheep production is now at a turning point with no clear future. This paper will try to explain the recent performance and the future prospects for the Tsigai breed. It is desirable to know the current state of Tsigai breed and to define and design strategies to rescue this local breed with new functions and performance. The role and the challenges for research to develop and protect this adapted breed will be derived in the context of the socio-economic framework conditions in Romania.

## 2 Sheep breeding in Romania

The first statistical data on sheep flocks breeding in Romania dates from 1860 (Table 1). In that year, a total number of 4.4 mio heads were counted. The number increased until 1985 up to 18.6 mio, the numbers already dropped significantly before the fall of the communist powers. Since 1986, the numerical evolution of the total sheep number raised in Romania started a downward slope. Among the causes of the

decline are the expansion of arable land, reduced pasture, adversity of the sheep farmers to sheep herds, especially transhumance, the hard life of shepherds, lower prices of other animal products (poultry, pigs and even cattle) and a relative increase in the price of sheep products (Drăgănescu, 2006). In 2010 only 9.141 thousand heads were kept. The reasons for this include the dissolution of large livestock state farms and cooperative farms after the end of the communist period on the one hand, and a change of land ownership on the other hand, as well as the membership in the EU. Under these conditions, large breeders without own agricultural land, pastures or meadows have started to decrease livestock, including sheep. Thus, due to diminishing interest in wool production and lower sales of biological reproduction material, valuable sheep flocks belonging of the elite core established for each local and imported breeds were recovered for meat production, delivered up to a 90 % as live animals on traditional markets in the Near East and Middle East countries.

Table 1:

The evolution of sheep flocks in the period 1860 to 2010 (thousand heads)

Year	Sheep flocks
1860	4.411
1890	5.002
1920	8.700
1938	10.086
1966	13.125
1985	18.637
2000	8.121
2010	9.141

Source: Nica, 1965; Ştefănescu, 1973; FAOSTAT, 2010a

In Romania there are two autochthon native breeds: Turcana, named also Zackel ("mountain peasant", "Romanian") or Walachian ("Romanian"), is the sheep of Sibiu transhumant shepherds, and Tsigai, the sheep of Braov and Covasna transhumant shepherds. Both are well adapted to the conditions of Romania, but Turcana may be better adapted to the alpine pasture. Tsigai, comprising 24.3 % of Romanian sheep, is a medium-wool breed, with good milk and good meat production. Turcana (52.4 %), a long coarse-wool breed, have good milk production, but poor meat production. From the Romanian breeds formed by crossing, Romanian merino breeds (Transylvanian Merino, Merino of Palas, Merino of Cluj) (9 %) and Karakul (5.4 %) are now more important from a numerical point of view. Crossbreeds (8.5 %) are scattered almost all over the country, and the difference of 0.4 % is comprised of other races (Raducuţa and Ghiţă, 2009).

### 3 The history of the Tsigai breed

Tsigai, a sedentary breed characterized by transhumance and related to Merino sheep, was initially the breed of Carpathians Bend Romanian transhumance shepherd, perhaps descendants of some Romans colonized there. They have white wool, brown, reddish or white face and legs (Picture 1 and Picture 2). In 1986, about 20 % of sheep in Romania, 1.9 mio, were Tsigai (Drăgănescu, 1998; Country report, 2003).



**Picture 1**  
Tsigai Breed Ram (photo: Dărăban)



**Picture 2**  
Tsigai Breed Sheep (photo: Dărăban)

The Tsigai, related to Merino and British Meat Sheep, is – from an economic point of view – one of the most important native sheep breeds in Central, South-Eastern and Eastern Europe (Drăgănescu, 1998). The breed is marked by the degree of improvement in group in “transition races”, making the transition from rustic to improved breeds (Pop et al., 1983; Dărăban 2006).

The Tsigai was apparently originally a sheep breed of the Carpathian Bend (Central Romania) long distance transhumance shepherds.

### 4 Milk, meat and wool production

#### 4.1 Milk production

Today, sheep of the Tsigai breed are kept in Romania for their dairy products, for the slaughtered young lambs (4 to 6 weeks, 10 to 12 kg), and for wool production. The ewes are milked. The performance of some Romanian sheep breeds for milk production and milk composition is shown in Table 2.

**Table 2**

The performance of some Romanian sheep breeds

Breed	Milk production (liters/lactation)	Breed		
		Fat (%)	Protein (%)	Solid (%)
Turcana	100 - 140	7.7	6.0	16.65
Tigaia	70 - 90	7.0	6.5	15.02
Merinos de Cluj	85 - 95	7.4	6.31	13.49

Source: Lujerdean et al., 2009

Sheep's milk is consumed only as a processed (either traditional or industrial) product in the form of feta cheese, sheep cheese or other products obtained only from sheep or sheep's milk mixed with cow's milk. Cheese consumption in Romania is around 2.5 kg year<sup>-1</sup> person<sup>-1</sup> (Nistor et al., 2010). Most of the milk production is traditionally processed, and is for family consumption or for sale on tourist markets or peasant markets through direct marketing channels. A small amount of milk is delivered to processing companies. The marketing channel in this case is short, consisting of processor, intermediary and consumer (Manole, 2011). The main traditional products made from sheep's milk are: „caş” (cheese), „brânza de burduf” (a strong, salty and kneaded cheese kept in the stomach/skin of the sheep), „brânza în coajă de brad” (kneaded cheese kept in pine bark), telemea (a fresh, whole feta-type cheese), „urda” – is made with the whey of the „caş” (cheese). It is like ricotta, relatively high in protein and low in fat.

Milk production and its transformation into different products are important activities that contribute to the supplementation of farm income, but, unfortunately, the sale of dairy products is poorly organized. An important outlet could be the foreign market, where products obtained by traditional methods enjoy high appreciation, with growing demand. A new strand of organic production is appearing. Organic sheep cheese farms are more professional compared to traditional production.

#### 4.2 Meat production

In Romania, sheep meat consumption is very low, the population demand for this product is only 4 % of total meat consumption, 2.5 kg year<sup>-1</sup> person<sup>-1</sup> respectively (FAOSTAT, 2007). The type of sheep meat depends largely on the age of lambs

to slaughter, traditions and consumer preferences (Taftă, 1983). Regarding the age of slaughter, there are two categories of lambs: milk lamb and fattened lamb.

Milk lamb is the most requested meat type of sheep in Romania. This meat comes from lambs slaughtered at 6 to 8 weeks and 8 to 15 kg live weight, the carcasses weighing 4 to 8 kg or less. Milk lambs are slaughtered every year in Romania in March to April at the Easter holidays. This shows that sheep meat consumption is seasonal, amounting to about 2 to 2.5 kg year<sup>-1</sup> person<sup>-1</sup> (FAOSTAT, 2007).

Meat of fattened lambs is obtained from young males and females who are eliminated from breeding, they are usually 14 to 15 kg at weaning and are fattened under semi-intensive or intensive systems (with high amounts of concentrates). They are slaughtered at a live weight of 35 to 40 kg, carcasses weigh on average 15 to 22 kg.

In the past 16 years, Romania was ranked first place in Europe regarding live animals exported for slaughter. In 2004 the maximum number of exported animals exceeded two million (Ilişiu et al., 2010). Over 97 % of the volume of exports is made up of young sheep of the Turcana race and the difference of 3 % is comprised of young sheep of the Tsigai breed (Ilişiu et al., 2011). The main destination of these exports is the West European countries (Italy, Spain), and Muslim countries (Saudi Arabia, Libya) (FAOSTAT, 2010b).

#### 4.3 Wool production

From 1950 to 1989 wool production played an important role in sheep-raising in Romania. Wool prices were supported by the Romanian state, being three to four times higher than the world market.

Since 1989, wool prices decreased to the world market level and the income of all sheep owners has decreased dramatically.

The removal of producer and consumer subsidies, privatisation of state enterprises, price liberalisation and reform of the financial sector had important implications for the structure of sheep farming and hence raw wool production in Romania. The privatisation programs have meant that many of the large state farms have been broken up into smaller land holdings. The large cooperative farms have been broken up into numerous small scale farms averaging only 1.6 hectares.

The decrease of wool prices had the effect of reducing the number of sheep in Romania. Most affected were former state farms (reduction of four times of sheep number) (Drăgănescu, 1998). Private sheep breeders could better face this situation, because their extensive production is cheaper and their production was more diversified with dairy and meat products, and continues to operate with low income. In 1992 to 1993 greasy wool production in Eastern Europe was 80 000 tonnes, of which 34 % was produced in Romania (Barett et al., 1993). Per person consumption of wool in Romania was 0.5 kg in the years 1987 to 1990 (Barrett et al., 1993). Today, wool production is not particularly important, and due to lower prices, the wool price received fails to cover expenses related to labor to achieve sheep herding.

## 5 Productive potential of Tsigai breed

Tsigai sheep are a multipurpose sheep breed with a live weight of 79 to 90 kg. They produce milk (individual variation 53 to 248 kg per 210 days); meat (4.1 to 4.3 birth weight, fecundity some 90 %, prolificacy some 115 %, natality some 105 %; the Turkish prefer it for meat quality), wool sheep (2.48 kg from 18,743 females in 1993; 4.47 kg from 807 males) (Drăgănescu, 1998).

Tsigai wool is white, rarely black, semi-fine uniform (28 to 32 microns) (Dărăban, 2006), with brown, reddish, white or spotted face and legs (polymorphism, less group, population characteristic). It is supposed that the white face Tsigai was produced in the 19<sup>th</sup> century by some cross with Merino during the transhumance in the Crimea and North Caucasus. Tsigai has angular form, is of medium size, with a long, thin tail. Rams are horned or polled (2 to 3 %) (long spiral horns as in Merino), ewes are polled or have small horns.

Because the Tsigai race is a rustic breed, over time research attempted to improve milk and meat production, most work was based on the use of industrial crossings with specialized imported breeds.

Thus, to improve the milk production of the Tsigai breed, studies at the Research Institute of Palas Constanta focused on industrial crossing between local Tsigai breed with rams from Awassi and East-Friesian sheep breeds in the period 1975 to 1983. Although the yields obtained from female crossbreeds were superior to the Tsigai breed, introducing a crossing program was not possible because the breeds used in the experiment were difficult to adapt to environmental conditions in our country (Păunescu et al., 1985).

Research conducted in Romania to improve meat production was focused on increasing prolificacy, improving skills for meat production and carcass quality. To improve the prolificacy of the Tsigai breed, experimental works have been performed to achieve prolific crossbred females by crossing of Tsigai breed with rams of a Finnish breed. Results obtained to improve prolificacy were a real possibility to increase the number of lambs for meat production, but as for imported breeds to improve milk production, the Finnish race was not resistant to local conditions (Ursescu, 1978).

Specialized breeds were imported for meat production to improve the skills of fattening and carcass quality, namely: Suffolk, Ile de France, Merinofleisch, German Blackface. The obtained results were in all cases higher than those obtained from the Tsigai breed (Ciolca and Timariu, 1972; Pop et al., 1976; Rău, 1998; Ilişiu and Rău, 2008), but under the potential of improved breed (for lamb).

## 6 Keeping in the past and present of Tsigai sheep in Romania – a study

From 1950 to 1989, wool was the main production objective of the Tsigai breed. Today it is no longer of great importance, so that the production function of the race has changed.

Socio-political changes and economic reforms that have taken place in Romania had caused significant changes in growth and exploitation of Tsigai sheep, including: a drastic reduction of sheep number and level of wool, meat and milk production; change in the direction of exploitation; cancellation of work to improve the herd through the disappearance of populations with determinant role in the genetic evolution of sheep flocks.

Changes that occurred in sheep-keeping were determined by many limiting economic, technical and social factors, including: increased operating costs opposite the very low recovery rates of production, size of farms or herds limit the introduction and application of the technical activities of reproduction, improved livestock and production of breeding material, lack of laws and regulations to support and protect the sheep breeders.

After 1990, the focus was on milk production, but since the Tsigai is a breed with modest milk production, fed under medium quality pasture, they do not bring the income needed for the sheep farmers. Also, since 2006, there were a series of experiments at the research stations and the sheep associations, experiments which were based on crossings between Tsigai breed with rams of specialized breeds for meat production German Blackface, Suffolk. The obtained results were in all cases higher than those obtained from the Tsigai breed (Ilişiu et al., 2010), but under the potential of improved breed (for lamb). The risk of losing the pure breed Tsigai is relevant and becomes evident because many sheep herders would like to increase the genetic quality of these high performance breeds in their herds.

Under these conditions, the maintenance of local sheep populations, as a reserve of genes, requires the adoption of measures for conservation.

Taking into account the low production indices that led to decreasing number of this population, it is necessary to give compensation to the sheep breeders who maintain this genetic stock.

Economic motivation would be the best starting point to avoid the cessation of the raising of the Tsigai breed, meaning decent incomes for families of sheep breeders. As noted, the most important reason for increasing the national sheep flock since 2002 has been grants awarded for animals under the *Official Control of Production* (OCP), and since 2007 by providing animal and land area payments, which has been beneficial for farm development.

In this context, finding new niches to bring added value to sheep farms would be a good approach for the breed preservation and husbandry.

## 6.1 Material and method

Visits to sheep breeders' farms, surveys and telephone interviews were conducted to collect information.

### 6.1.1 Collecting data on sheep farms

Data collection was conducted with visits to farms and telephone interviews with 30 small, medium and large sheep farms

(ten from each category). The investigations were conducted in November and December 2011. The addresses of surveyed sheep farms were obtained from breeders' associations.

To prepare for the survey a questionnaire was conducted comprised 55 questions grouped into seven categories as follows: data on the farm (twelve questions), farm management with questions related to milk, meat and wool production (nineteen questions), market and marketing (four questions), the existence and necessity of research units (nine questions), research and development (one question), education and extension (five questions), organic agriculture (five questions).

The interviews lasted between 15 and 45 minutes, the average was estimated at about 20 to 25 minutes. At the end, the opinion of sheep breeders regarding survey questions and points of view that were not included in the questionnaire was requested.

The statistical analysis was carried out with the aid of the Winstatistical program. Mean is shown with standard error.

## 6.2 Results

### 6.2.1 General information on sheep farms

Table 3 provides an overview of the number of farms surveyed and their distribution in different counties.

Table 3

Number of farms surveyed and their distribution in different counties

County	Number of surveyed farms	Sheep number	$\bar{X} \pm s_x$	Minimum number of sheep	Maximum number of sheep
Alba	2	700	350 ± 201	150	550
Arad	5	1,400	280 ± 108	100	700
Brasov	6	10,500	1,750 ± 615	500	4,000
Cluj	5	910	182 ± 33	100	300
Covasna	6	1,963	280 ± 112	30	800
Mures	6	2,800	467 ± 81	200	800
Total	30	18,273	609 ± 160	1,080	7,150

Source: own data

In total 30 farms were surveyed which have 18 273 sheep of Tsigai breed (average 609 ± 160 sheep). Turcana breed can be found alongside the Tsigai breed in 43 % of the surveyed farms.

Of the total surveyed farms, 77 % predict that they will increase the sheep number in the future. A percentage of 33 % of the farms were included in the Official Control of Production (OCP).

Regarding the mode of land ownership, 93 % of total questioned farms are both land owners and renters, the average area of land/ farm is shown in Table 4.

**Table 4**

Grassland area owned of sheep farms (mean ± standard error )

County	Number of surveyed farms	Total land (ha)	Owned land (ha)	Rent land (ha)
Alba	2	72 ± 34	17 ± 13	55 ± 21
Arad	5	32 ± 6	19 ± 5	13 ± 4
Brasov	6	881 ± 251	248 ± 101	633 ± 154
Cluj	5	125 ± 34	32 ± 54	93 ± 28
Covasna	6	90 ± 37	28 ± 10	62 ± 27
Mures	6	109 ± 15	26 ± 7	83 ± 14
Total	30	247 ± 77	70 ± 25	177 ± 52

Source: own data

In terms of direct payments per area, 90 % of breeders receive payments/land area, 7 % do not receive payments, and 3 % received payments only on one part of the land which they have rented.

Although all surveyed breeders believe that their farms will exist in the next 10 years, 37 % believe that without payments, they would not practice this activity.

Practicing this activity provides a decent living for 70 % of farm families, those who can't generate a decent family living by practicing this activity are generally farms with up to 350 sheep, and only one farm with over 800 sheep. 73 % of surveyed farms have foreign staff employed at farm, with work being carried out, both in winter and summer, by family members.

Currently, the tendency of sheep-raising is for milk-meat for 77 % of the surveyed farms. In the future, significant changes are expected in the direction of the Tsigai breed for meat-milk production (53 %).

The main reason for the orientation of sheep breeders toward meat-and-milk production is the lack of human resources. Farmers believe that if sheep-raising is oriented to meat production, labor volume is much lower (by removing the milking and leaving lambs to suck up to the end of August). On the other hand, the increasing demand for meat production and satisfactory prices obtained from the lambs capitalization is a strong enough motivation for them to strengthen this production.

## 6.3 Production management

### 6.3.1 Milk production

In terms of milk production, 93 % of the farmers are satisfied with the milk production obtained from the Tsigai breed. Although farmers believe that milk yield from Tsigai sheep is good, 77 % want to improve this production in the future by crossing it with specialized breeds for milk production (39 %) or selection (61 %).

More than a half of the farms included in the survey process the milk in their own farms (70 %), while 27 % deliver it directly to a processor. From the milk obtained and processed in farms, breeders made traditional products, the first among manufactured products is telemea (a fresh, whole feta-type cheese), which is produced in 85 % of the farms, followed by sheep's cheese („caş”). In general, more than one dairy product is produced at the farm level. Therefore, 57 % of the farms that produce traditional dairy products make three products:

„Telemea”(feta-type cheese) + „Caş”(cheese) + „Urda”(67 %), „Telemea + „Brânză frământată”(kneaded cheese) + „urda”(25 %) or „Caş” + „Brânză frământată” + „Urda”(8.33 %). In 97 % of surveyed farms, products are both for market and consumption.

### 6.3.2 Meat production

Even if 67 % of the breeders consider that the Tsigai pure breed could be efficiently exploited just for meat production, they apply crossbreeding with breeds specialized in meat production, the most frequently encountered being German Black-face breed. Only 33 % of surveyed farms do not accept breeding with rams of meat breeds. Lamb fattening is realized mostly in an extensive system (77 %), followed by the intensive system (17 %). The mean weight at the valorification of the lambs is 25 to 20 kg at 50 % of the studied exploitations and 30 to 35 kg in 23 % of the exploitations. Rarely were valorifications found to contain between 35 to 40 kg (10 %) and 40 to 50 kg (10 %). Sales of the lambs are performed live in all farms included in the study, the period of capitalization is very varied, as follows: August to September (53 %), March to May (37 %) and June to July (10 %).

With regard to the potential of Tsigai breed for meat production, 57 % of the breeders believe it would be more efficient to keep the pure breed for meat than for milk production. 93 % of the questioned breeders have considered that using crossbreeding of the foreign breeds specialized by meat production for half-breed lamb production would make the growth of the Tsigai breed more efficient. Because of the adaptability and the high resistance of the Tsigai breed, 77 % of the breeders would not give up growing Tsigai breed in exchange for one foreign breed specialized for meat or milk production.

### 6.3.3 Wool production

The wool sector has been insignificant in the last years because the lack of the demand and the low prices obtained by the sales. 53.33 % of the questioned exploitations believe that there is no demand for wool production, and incomes achieved from wool valorification are approximately equal to the sum paid for the shearing realized in 50 % of the exploitations and less in 30 % of the exploitations included in the study. Only 20 % of the breeders make a profit from the wool capitalization.

In this context, 70 % of the exploitations do not want to improve the wool production in the future, while 30 % want to improve this production just if the price were to grow and if demand would grow for this product.

### 6.3.4 Market and marketing

Regarding the sale of dairy products obtained from sheep, the majority of breeders sell their products directly, either at markets or fairs (33 %), directly from home (13 %) or through intermediaries (20 %). Just a small number of breeders (7 %) capitalize their products in supermarkets. The main reason that the breeders can't capitalize their products in supermarkets is that only 7 % from the exploitations have products with trademarks.

90 % from those interviewed would in the future like to realize regional products with trademark at the association level to which they belong. Dairy regional products with trademark are desired by 63 % of the breeders, while the meat products are desired by from 22 %. The capitalization prices obtained from sheep are reproduced in Table 5.

### 6.3.5 The existence and the necessity of the research units

The existence of the Research Institute for Sheep and Goats Palas Constanta are known by 63 % of those questioned, and existence of Research Station for Sheep and Goat Reghin is known by 57 % of breeders. 13 % of the breeders have participated at meetings realized by this research unit, and only 7 % have been visited by experts from this research stations. The breeders' contact with the Research Station for Sheep and Goats Reghin was very reduced (10 % from exploitations), even if they appreciate in a very high percentage (93 %) of the information that could be provided by the experts from the research stations, which could help them to obtain higher economic results in their own exploitations, compared to what they obtain at present.

97 % from the breeders appreciate that the Research Station for Sheep and Goat Reghin is necessary, the most frequent motivations for this being: the transfer of information to the breeders; for the news brought into the research; the Tsigai breed preservation, and the furnishing of the valuable breeding material. This has not recently been fulfilled to this extent.

### 6.3.6 Research

Regarding the domains to which it should be currently directed the research, 40 % from the questioned, consider that the research should focus on the production of meat with an accent on the carcass and meat quality, followed by researches for milk quality (27 %). The research for product quality is expressed by 10 % of the breeders, as the research for the improve milk production, improve meat production and the growing technologies are expressed equally (7 %). Least important for the breeders seems to be the research regarding animals health (3 %).

### 6.3.7 Education and extension

All the questioned farmers want the experts from the research stations to contact them and offer them information. 67 % of sheep breeders believe that the contact with specialists should take place every three months, while 27 % believe that contact with specialists should take place every two months.

In terms of the professional preparation in the sheep domain, this is owned by 57 % by the breeders. The desire to participate in professional training courses by those who do not possess this qualification was expressed by 92 %. Regarding exploitation efficiency, 77 % of the breeders without qualifications consider that they could obtain better economic results than they presently obtain, if they had a professional training in this domain.

Table 5

Price of the products obtained from sheep

Product	Price (lei/Euro)					
	Maximum price		Minimum price		Average price	
	lei	euro	lei	euro	lei	euro
Wool (kg)	3.5	0.81	0.8	0.19	2.0 - 2.5	0.48 - 0.6
Meat (kg)	11.0	2.62	7.0	1.67	9.0 - 9.5	2.14 - 2.26
Milk (l)	2.2	0.52	1.8	0.43	2.0 - 2.1	0.48 - 0.50
Cheese curd („caş de oaie") (kg)	20.0	4.76	9.0	2.14	13.0 - 14.0	3.1 - 3.33
Kneaded cheese („brânză frământată") (kg)	30.0	7.14	15.0	3.57	20.0 - 21.0	4.76 - 5.0
Cottage cheese („telemea") (kg)	20.0	4.76	13.0	3.1	13.0 - 13.5	3.1 - 3.22
Cheese („cascaval") (kg)	35.0	8.33	22.0	5.24	25.0	5.95
Soft cheese („urda") (kg)	12.0	2.86	8.0	1.91	9.0 - 9.5	2.14 - 2.26

\* The price calculation in euro has been made taking into account 1 Euro = 4.2 lei.

Source: own data

In general, the breeders belong to a professional association (93 %) which supports them in their activity by supplying information, negotiating prices for meat, milk, wool and the purchasing cheaper medicines and feed.

### 6.3.8 Organic agriculture

97 % of the questioned farms practice conventional agriculture, just one farm being in conversion (3 %). In general, the breeders' knowledge about organic agriculture is minimal (80 % of those questioned) and is limited at the fact that they know that using chemical fertilizer and pesticides would be forbidden should they practice organic agriculture. The reasons why they don't practice organic agriculture vary, but in the most cases are invoked by the lack information (28 %), lack of land ownership (21 %), the documentation volume for the exploitation certification (10 %), and on the same level (7 %) is the low animal effectiveness with the lack of organic feed.

The strongest motivation for practicing organic agriculture could be of economic nature (34 %), meaning the income obtained in the practice of the organic agriculture would be superior to what they they have at present. Not only the economic factors play an important role making this decision, but also owning their own land (17 %) and the existence of the organic certificate feed (14 %). In the same measure (3 %) are said to simplify the documentation, the existence of other breeders who practice organic farming, and better knowledge of the situation of organic farming.

Regarding the problems of sheep breeders which could meet requirements for practicing organic farming, 31 % of those surveyed do not know what problems they would encounter, 28 % believe that the lack of certified organic feed would be the main problem they would face, 14 % think that there would be no problems, while equally 7 % of those surveyed believe that treatments, lack of demand and market products could be major problems.

## 7 Research and extension demand

### 7.1 Resources

Currently, the Research Station for Sheep and Goat Reghin has a 961 heads of sheeps and goats, of which 707 heads are sheep (416 sheep mothers) of the Tsigai breed and crossbreed German Blackface x Tsigai and 254 heads goats (117 goat mothers) of the local Carpathian race and crossbreed Saanen x Carpathian.

The land under management for fodder achievement and grazing is an area of 217 ha, of which an area of about 52 ha can be used for feed production, the rest is very poor quality. To complete the grazing needs, but also for enhancement of the feed resources in the mountain area, the unit has leased 130 hectares pasture located in Caliman Mountains at an altitude of 1500 m.

Regarding the ongoing research projects, currently our research station participates as collaborator to a single research project (collaborator of Research Institute for Sheep

and Goats Palas – Constanta). A lack of research projects and the necessary funding hampers research and technology transfer. Since 2009, research funding was much reduced due to economic crisis, making it almost impossible to carry out the needed activities.

The Research Institute for Sheep and Goats Palas – Constanta, as scientific and technical coordinator of the research units in the field, submitted a thematic research plan, stemmed from frequent consultations with the breeders associations regarding their requirements, to the Academy for Agricultural and Forestry Sciences Bucharest (ASAS) in 2011. Requirements focused mainly on genetic improvement, on improving the morpho-productive performance of the sheep and goats breeds that they hold, and optimization of husbandry technologies according to production direction: meat, milk, wool.

### 7.2 Research objectives

Given the requirement of sheep breeders and the need to save the Tsigai breed, future research objectives of Research Station for Sheep and Goat Reghin should be the following:

- increasing production performance for meat and milk – dual purpose – of Tsigai sheep – 53 %;
- improved organic lamb production – 47 %;

The future research objectives of our research station are in accordance with proposals by advisory board made up of farmers, sheep breeders associations, stakeholders, academics specialized in sheep and researchers from research units.

## 8 Conclusions

In order to improve sheep husbandry in Romania, and especially to preserve the local Tsigai breed, it will be necessary to take direct action involving both researchers, sheep breeders and other decision makers, with actions materialized in:

- 1) Establishing dairy premium products, identifiable by quality labels and geographical origin (PDO) and their inclusion in a chain of organic production for adding more value to the race.
- 2) Improving the marketing of the product by conducting activities to help strengthen the product profile, creating a regional image and informing customers about product quality, production conditions and conservation benefits of the Tsigai breed.
- 3) Recovery of feed resources on sub-mountainous and mountainous pastures by extensive grazing with an effect on landscape conservation and the maintenance of valuable plant species in the vegetal cover, leading to regeneration and nature conservation.
- 4) Involvement of decision makers to provide the state aid regarding the use of genetic resources of endangered animals.



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