

THE ECONOMIC VALUE OF SELECTION CHARACTERS OF MOLDOVAN KARAKUL SHEEP

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Abstract

The purpose of this work was to examine, at different historical stages of human society development, the economic importance of Karakul sheep morph characters and to identify the main selection characters, by determining their economic value in that phase. The research was done on the Moldovan Karakul sheep flock of the National Institute of Animal Husbandry and Veterinary Medicine, from the village of Maximovca, Anenii Noi district, Republic of Moldova, as well as the review of specialized literature on Karakul sheep, raised on our country territory, in different historical periods of social development. At the sheep from the examined flock was determined the absolute and relative economic value of morph productive characters, subsequently setting the opportunity of animals selection by some or other characters. The research has shown that the relative economic value of morph productive character, which reflects the share of economic income generated from the production revaluation, resulted from this character, in the total amount of the income obtained from the animal, by revaluating of all production per year, may vary depending on the technological solution of sheep exploitation. Thus, the relative economic value of milk production character, varies from 66.0% in the first technological case - where all the lambs are slaughtered for the fur skin, up to 50.1% in the second case - where all the lambs are left to grow up and are fed with milk until the age of 60 days, with subsequent milking of the sheep over 3-4 months and slaughtering for meat of the young sheep at the age of six months, and up to 60.8 % in the third technological (mixed) case – where only a part of newborn lambs (55%) are slaughtered for the fur skin, mainly of over remounted young rams and ewes and with growing of other part of lambs, mainly young ewes for the remount. The relative economic value of the meat production character varies from 15.8 %, in the first technological variant, up to 47.8 % in the second case, and 27.1 % in the third technological variant. The relative economic value of the fur skin together with clot, as its related production, ranks third among the selected characters, with a share of 18.0 – 11.8%. As a result of research, were made the conclusions, that, the milk and meat production are the main characters of selection of Moldovan Karakul sheep, but fur skin production, although is a primary selection character of this sheep race, remains a third importance character. To determine the economic value of morph productive characters and to identify their importance for the respective race selection requires regular updating, at least once in ten years.

Key words: evaluation, economic, characters, selection, sheep, Karakul

INTRODUCTION

The Karakul sheep selection, like any other animal selection, is conditioned by the trade economic interest, related to the animal growing and its exploitation. The advantages and disadvantages of Moldovan Karakul sheep exploitation are determined as by the material income generated from the revaluation (trade) of respective production, as well as the

expenses of their growth and maintenance. The income structure obtained as a result of these production revaluating, expressed in national or convertible currency, and the expenses at the sheep production manufacturing, vary depending on the market demand and supply to some or other product typical to the socio-economic development of human society, of the actual custom existing in society, of the geographical area, where these sheep are grown, of the size and price correlation existing at that stage in various goods, services and production, of the sheep

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productivity level in the respective exploitation conditions.

In the market economy, the sheep selection actuality, by one or more morph productive characters, needs to be justified by its economic efficiency, determined by economic value of selection characters and expenses requested to obtain the respective production. Considering the fact that the expenses of sheep growth and their exploitation are general at every sheep farm (exploitation), the economic value of one or another character selection can be expressed both, as in absolute monetary size as well in relative size (% share).

The research accomplished in this field [1-3, 5, 7, 9-11] have shown that the economic interest of growth and exploitation of one or another animal race or species is determined by the market demand for the sale of respective animals production, varying quite widely, depending on the stage of socio-economic development of human society and custom, such as the use of animal fur skins for fur coats, collars and caps, the wool for carpets, thick cloths and handicrafts confection etc.

As example can serve the reports of the Russian researcher M.Карпов [11], dated 100 years ago, regarding the fur skins and Karakul sheep: *"The rising demand of fur skins has conducted to exceeded price increase. Thus, the karakul fur skins prices, in last 15 years, increased by 140 %, and breeding ewes and rams, previously assessed with 6-16 ruble/head, now are sold tens of ruble more (16-60 ruble/head, as I had the opportunity to buy). The increasing interest for karakulture can be expected in the future, both, primarily due to the above-mentioned positive qualities of karakul fur skins and partially to the noticed reduction of the number of wild animals noble fur skins, exterminated by humans, which caused the rising of these furs prices, on the one hand, and human population growth on the other."*

The regular updating of the economic value of the sheep morph productive characters is needed to determine the direction of their selection according to market demands in order to increase the

economic efficiency of animal exploitation from respective race.

In this context, the actual work study, proposed to examine, at various historical stages of economic importance, of Karakul sheep morph productive characters, to identify the main selection character and to determine their actual economic value.

MATERIAL AND METHODS

The research was done on the Moldovan Karakul sheep flock of the National Institute of Animal Husbandry and Veterinary Medicine (Maximovca village, Anenii Noi district, Republic of Moldova), as well as on the review of specialized literature on Karakul sheep, raised on our country territory, in different historical periods of socio-economic development of the society.

At the sheep from examined flocks, was determined the absolute and relative economic value of morph productive characters, with a further settlement of the animal selection opportunity by some or other characters.

The absolute economic value of the morph productive character was determined by the monetary amount, resulted from multiplying the production quantity, which can be obtained as a result of this character revaluation from one animal per year, at the retail price of one production unit. This value was expressed by the following formula:

$$V_{ea} = C_p \cdot P_c$$

where:

V_{ea} – the absolute economic value of the selection character, expressed in national or convertible currency;

C_p – the production quantity, obtained from this character revaluation from one animal per year;

P_c – the trading price of one unit production, obtained from this character.

Given that, the absolute economic value of the selection character does not reflect just its overall economic importance of the animal morph productive characters, in order to elucidate the real economic value, it was examined in correlation to other morph productive characters, to determine its

importance in global income obtained from all other characters (production) taken together.

The relative economic value of the selection character was determined by correlating of the absolute economic value of the selection character to the total amount of income derived from an animal per year from the revaluating of the production as the result of all morph productive characters manifestation, and represents the value share of the morph productive character in the total production economic value obtained from an animal per year.

The calculation formula of the relative economic value of the selection character was expressed as following:

$$V_e = \frac{C_p \cdot P_c}{S_t} \cdot 100 \%$$

where,

V_e – the relative economic value of the selection character;

C_p – the production quantity by this character from one animal;

P_c – the trade price of one production unit;

S_t – the total amount of the income obtained from an animal per year.

The absolute and relative economic value determination, by morph productive characters, was performed, in profile, on three different technological methods of Karakul sheep exploitation: *first case* - where all lambs are slaughtered at 2-4 days after birth in order to obtain fur skins and the sheep are milked during 5-6 months; *second case* - were all lambs are left to grow and are fed with milk until the age of 60 days, with a further sheep milking during 3-4 months and slaughter for meat of youth sheep at the age of 6 months; *the third variant is mixed* – when is provided the slaughtering of a part of the newborn lambs (55%), mainly of over remounted young ewes and rams, and growing of the other part of lambs, mainly ewes for remount.

This allowed to identify the main selection characters, reducing their number, framing, subsequently, some complex indices of animal selection and as a result, increasing the efficiency of the Moldovan Karakul sheep selection and genetic amelioration.

RESULTS AND DISCUSSIONS

The research has shown that the relative economic value of the morph productive character, which reflects the *money income share*, obtained from the production revaluation of this character, in the total amount of income obtained from each animal, by revaluation of all production per year, may vary depending on the technological method of sheep exploitation. For example, in case when the Moldovan Karakul lamb is slaughtered for the fur skin, from a sheep, per year, can be obtained production with different economic values of the morph productive characters (table 1).

The data presented shows, that, it is evident that from a good sheep, who foaled a lamb (slaughtered at the age of 2-4 days) with fur skin qualities of class I, may be obtained yearly, an absolute monetary income, with a total amount of 1333 lei. The highest absolute and relative economic income is obtained from the productive character revaluation - the milk production. With a productivity of 72 kg of milk, during the whole lactation, from a sheep can be made 16 kg of moldovan cheese, from whose sale is collected 880 lei. The relative economic value (share) of this productive character is very important and represents 66.0%. After the milk production, on the second position, at a quite detached distance, ranges the economic value of the lamb carcass, slaughtered for the fur skin (meat production), with the absolute amount of 210 lei and 15.8% share, followed on the third place, by the economic value of the fur skin, with the amount of 140 lei and 10.5% share.

On the fourth place, by the economic value, is placed the clot of the slaughtered lamb, with the amount of 100 lei and 7.5% share.

Table 1. The production obtained from a Moldovan Karakul sheep per year and morph productive characters economic value, in case of lambs slaughtering for fur skin

The production name resulted from morph productive character revaluation, unit of measure	Production quantity	Production trading price, lei/unit	The absolute economic value of morph productive character, lei	The relative economic of morph productive character, %
Karakul fur skin of I sort, pieces	1	140	140	10.5
The carcass of slaughtered lamb at age 2-5 days after birth, kg	3.5	60	210	15.8
The clot of slaughtered lamb, pieces	1	100	100	7.5
The cheese obtained from one ewe milk (72 kg), kg	16	55	880	66.0
The rough wool, kg	3.0	1	3	0.2
Total	x	x	1333	100

The Moldovan Karakul sheep wool rough, is actually, an afferent-secondary morph productive character, often felted with thistles, has a miserable economic value (basically no value). Therefore, we excluded this morph productive character from the sheep selection and genetic melioration process.

Therefore, the analysis of presented data shows that, in case the lamb is slaughtered for fur skin, the economic value of milk

production, as an important selection character, acquires, nowadays, a decisive role in economic efficiency argumentation of selection.

Compared to the case when the lambs are slaughtered only for fur skin, the economic value of morph productive characters, is basically changing, in case when the ram lambs are left to grow, in order to be slaughtered for meat at the age of 6 months (table 2).

Table 2 The economic value of Moldovan karakul sheep morph productive characters, in case of ram lambs growth until the age of 6 months

The production name resulted from morph productive character revaluation, unit of measure	Production quantity	Production trading price, lei/unit	The absolute economic value of morph productive character, lei	The relative economic of morph productive character, %
The carcass of youth sheep at the age of 6 months, kg	12.0	35	420	47.8
The sheep fur skin of slaughtered lamb at the age of 6 months, pieces	1	15	15	1.7
The cheese obtained from milk of one ewe (36kg), after the lambs weaning, kg	8	55	440	50.1
The rough wool (ewe+lamb), kg	4.0	1	4	0.4
Total	x	x	879	100

In the second case of Moldovan Karakul sheep exploitation, when the ram lambs are left to grow in order to be slaughtered for meat at the age of 6 months, the absolute economic value of all selection character is a little bit smaller compared to the first method (when the lambs are slaughtered for fur skin), with 454 lei, or 34.1 %. At the same time, the highest absolute and relative economic value, as in the first case, also has the selection

character of milk production, from whose revaluating is obtained 50.1 % of total income, from a sheep per year. The second place, by the economic value, with a share of 47.8 %, at a quite small distance, is taken by the meat production resulted from the selection character – the body weight. Another production, such as fur skin of youth sheep slaughtered at the age of 6 months and the rough wool production, has an

insignificant share (1.7 and, respectively 0.4%). Lacking the economic value, these characters are omitted by the breeders from the process of selection and genetic amelioration of the sheep.

In other technological alternatives of Moldovan Karakul sheep exploitation, especially, for breeding youth growth, the body weight, acquires a very important economic value and becomes a primary selection character.

Usually, at an ordinary farm, is practiced the mixed method of Moldovan Karakul sheep exploitation, which provides the slaughter, for fur skin, of only a part of newborn lambs (ram lambs and ewe lambs over remount) and the growth of other part of lambs (mostly ewe lambs) for remount. In this case, the economic value of the morph productive character is determined from the calculation to 10 or 100 sheep (table 3).

Table 3. The economic value of morph productive characters according to the mixed method of Moldovan Karakul sheep exploitation, calculated at 100 sheep

The production name resulted from morph productive character revaluation, unit of measure	Production quantity	Production trading price, lei/unit	The absolute economic value of morph productive character, lei	The relative economic of morph productive character, %
Karakul fur skins (55 % of newborn lambs), pieces	55	140	7.700	6.9
The lambs carcass slaughtered for fur skin (55 x 3.5 kg), kg	192.5	60	11.550	10.3
Clots, pieces	55	100	5.500	4.9
The meat of grown youth sheep (45 head x 12 kg), kg	540	35	18.900	16.8
The cheese of ewes milk, after the lambs slaughter (55 x 16), kg	880	55	48.400	43.2
The cheese of ewes milk, after the lambs weaning (45 x 8), kg	360	55	19.800	17.6
The rough wool (100 x 3), kg	300	1	300	0.3
Total	x	x	112.150	100

The data analysis from mixed version of Moldovan Karakul sheep exploitation, demonstrates that the economic absolute and relative value of selection character – the milk production, as in other variants of sheep exploitation, is the highest. From milk production revaluation, by manufacturing of traditional cheese, is obtained 60.8% of the total income, realized from the calculation to 100 sheep.

The body weight, being also an important selection character, from whose revaluation results the meat production, with the relative economic value of 27.1%, ranks second place, in the total income obtained from 100 sheep.

The fur skin production, as in other variants of sheep exploitation, ranks on third place with a relative economic value of 6.9%, followed by clots production with 4.9 % and wool, with 0.3 %.

It should be mentioned, that, these results are in accordance with the research of some

authors, based on the data obtained from other sheep races, in other countries. Thus, according to research of Ф.В.Ильев 1966 [8], in Italy, for example, the income share original from the sheep cheese sale is on the first place and represents 63.3 % of total income obtained on average from a sheep per year, the second place ranks by the meat production with a share of 19.0 % and the wool production on the third place with a share of 15.7%.

Thus, analyzing the economic value share of the selection characters of the total income obtained from a sheep, or from 100 sheep per year, we find that in no one of the technological sheep exploitation examined system, the fur skin production is not on the first plan, so this character cannot be basic, contrary, it is much more detached after the economic value of milk and meat production.

In this context, occurs a question: How, in the specialty literature rooted the

affirmation, that the main production of Karakul sheep is the fur skin?

The answer to this question can be found in the investigations of the Karakul sheep morph productive characters economic value in different historical periods of human society development, both in our country as in another in other regions where this sheep breed is spread, starting from the first

decades of the XXth century – when the Karakul breed spreads in Bessarabia, Europe, Africa and other continents.

Thus, based on the research done by the Agricultural Society from Poltava Gubernia of Czarist Russia, by Иванов М.Ф. 1914 [6] brings various information on the structure and absolute income obtained from a Karakul sheep per year (table 4).

Table 4 The structure and the absolute income obtained from a Karakul sheep per year at some farms from south of Russia (by Иванов М.Ф., 1914)

Production name	The farm of Дуван С.Э., Gubernia of Tavria		The farm of Леонтович С.Г., Gubernia of Herson	
	The absolute income, <i>ruble</i>	The total income share, %	The absolute income, <i>ruble</i>	The total income share, %
The lamb alive with fur skin	7.50	56.4	6.50	48.1
The ewe milk (cheese)	4.00	30.1	6.00	44.4
The rough wool	1.80	13.5	1.00	7.4
Total	13.30	100	13.50	100

From the data presented in the table, it is evident that at that stage of human society development in Tsarist Russia, the fur skin relative economic value, taken together with the lamb carcass value, ranks first in the share of total income obtained from a sheep per year, and represented at different households, 48.1-56.4%. The economic value of milk production, revaluated in cheese, ranked second with a share of 30.1-44.4%. We notice that the fur skin relative economic value, taken together with the lamb carcass value, was 8.3-87.5% higher than the economic value of milk production revaluated in cheese. The wool production had a lower relative economic value (7.4 - 13.5%), compared to the first two productions, but rather significant, compared to the actual situation in our country (0.2-0.4%). In broader information, the author brings data related on one of the farms of Gubernia of Bessarabia, which had a number of 412 sheep (Table 5).

Overall, at this examined farm (household), the economic value of fur skins obtained from slaughter of 50.5% of newborn lambs was 60.4% of total income per farm. From this share, follows the conclusion that the fur skins production was, indeed, on that time, primordial and primary. On the second place, by the economic value, ranged the wool production with a summary share (of wool) of 18.5% and only on the third place is the cheese production, with a share of 14.2% in total income obtained overall on the farm. It should be mentioned, that the structure of the economic value share of the production in the total income obtained per year from a sheep or, overall on the farm, is determined by the price per a production unit, which is created and changed in market conditions, not only each decade or century, but even every year. This fact is confirmed by several researchers at different stages of social development [3, 6, 7, 8, 9, 11].

Table 5 The economic value of production obtained in household of Krupenski M.G. (412 sheep), vil. of Lomacineț, uezdul Hotin, Gubernia of Basarabia (by Иванов М.Ф., 1914)

The production name, Measure unit	The production quantity	Production trade price, rub/unit	Income from trade, rub	The share of total income, %
Karakul fur skins, pieces	208	5.0	1040.0	60.4
Sheep rough wool, pud	48.4	6.0	290.4	16.9
Lamb wool, pud	3.53	8.0	28.2	1.6
Sheep fur skins, pieces	60	1.25	75.0	4.4
Sheep meat, pud	22.5	2.0	45.0	2.6
Cheese, pud	60.98	4.0	243.9	14.2
Total	x	x	1722.5	100

Thus, according to the communication of Дуван С.Э. (quoted by Иванов М.Ф., 1914), the Karakul fur skins of best quality of his household, from Gubernia of Tavria, obtained in the breeding flock, were sold at the prices of 15-35 ruble/piece. We assume that the author was referring to the tanned fur skins.

According to the communications of Карпов М.С. 1912 [11], registered in the records of a foreign company, that was making large purchases of Karakul fur skins in Moscow and Nizhnii Novgorod, the average purchase price of a fur skin was: in 1895 – 3.91 rubles; in 1902 – 6.63 rubles; in 1909 – 8.70 rubles. Thus, over 15 years, the price of fur skins increased 2.2 times. Most requests for Karakul fur skins came from Canada, France, Germany and other countries. All merchandise of Karakul fur skins for trade with the Occident, was concentrated in Moscow and Nizhnii Novgorod, from where it was provided to the fur trade world centre of Leipzig, Vancouver, London.

In other information, Иванов М.Ф. 1914 [6] reported that the rough wool cost 5.5 ruble/pud, and a pud of cheese cost 5-6 ruble, so a wool pud equate with a cheese pud.

Generalizing the information of those times, we can deduce the following prices of sheep productions:

- 1 fur skin cost on average 7.0 ruble;
- 1 kg of meat cost (16 kg = 2.0 rubble) 0.13 rubble;
- 1 kg of cheese cost (16 kg = 5.5 rubble) 0.34 rubble;
- 1 kg of rough wool (16 kg = 5.5 rubble) 0.34 rubble.

Comparing these prices of fur skins with those of cheese, meat and wool, we observe, that by the economic value, a fur skin with a

now price of 6-8 lei equates to 46-61 kg of meat or to 20-21 kg of cheese, or wool.

For us, nowadays, is surprisingly that, in addition to a big value of Karakul fur skins, the rough wool was, at that time (1912), also a very important economic value, compared to other productions.

Thus, 1 kg of rough wool equated to 1 kg of cheese. The price of 1 kg of rough wool was 2.6 times higher than that of 1 kg of sheep meat.

In our opinion, this situation can be explained by the fact that at that time, was not developed the artificial and synthetic fibres industry, which currently has replaced much of the wool industry.

The increase process of human population on the Earth, which exceeded, currently, the number of 7 billion, as well the accelerated development of scientific and technical progress in all the fields, especially in fibres and artificial fabrics industry, changed radically the correlation of sheep production economic value in favour of food (milk, meat) and into the detriment of non alimentary sheep products. The artificial fibres and clothing industry development, fashion as well as the Greens movement from the occident, led to the substitution of a considerable part of natural furs, especially of Karakul fur skins and wool, out of clothes confection industry.

Nowadays, one of the peculiarities of the correlation changes of the sheep production economic value consists in the fact, that the fur skin production is one of the selection characters of Moldovan Karakul breed, although remains important, cannot be considered primary. By the economic value, the Karakul lamb fur skin, taken together

with its clot, as a related production, in the mixed variant of sheep exploitation, has a share of only **11.8 %** of the total income from a sheep per year. The price of one Karakul fur skin in Republic of Moldova equates to 2.33 kg of carcass meat. In order to compare, we report that, according to research from Kazakhstan (Бастаев А.У., Онкуляев М.А., Зулаев М.С., 2010) [4], the price of Karakul fur skin, in this country, equates to 2.0 kg of carcass meat.

A second particularity of the economic value correlation of the selection characters, is that milk production revaluated to cheese, took first place in the structure of total income obtained from a sheep per year, with a share of 60.8 %, followed by the meat production with a share of 27.1%.

Therefore, generalizing the results of the economic value analysis of Moldovan Karakul sheep morph productive characters, we can say that this (value) determines the selection importance and varies at different historical stages of social and economic development of human society, based on sale market demand. Taking into account the fact that the economic value of the selection characters are changing not only every 10-20 years, but in some cases, also every year, that is why, it needs to be updated and calculated, periodically, at least every 10 years.

Nowadays, the main selection characters of Moldovan Karakul sheep are the milk production – with a share rounded to 60%, and meat production - with a share of 28 %, followed by the fur skins production - with the share of 12 %, which can be considered an important selection character, but not the main one.

Other sheep productions (wool, leather), actually, completely lost their economic value, that is why these morph productive characters were excluded from the selection and genetic amelioration process of this sheep breed.

CONCLUSIONS

1. The milk and meat production, nowadays, represents the most important selection characters of Moldovan Karakul sheep.

2. The fur skin production, although remains an important selection character of Moldovan Karakul sheep, ranks the third

position, by its economic value (share) in the total income obtained from the sheep of this breed.

3. The determination of morph productive characters economic value and identification of their importance for the selection of nominalised sheep breed needs to be updated, periodically, at least once in 10 years.

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