

CURRENT SITUATION AND PERSPECTIVE OF CATTLE BREEDING IN REPUBLIC OF MACEDONIA

B. Palaševski, Z. Naletoski, N. Mateva

Institute of Animal Science, Skopje, Macedonia
Corresponding author: palasevskib@yahoo.com
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Abstract: Lack of food, especially lack of protein in this millennium will be main problem in many countries, especially developing ones. Satisfying of the needs of the human population in nutrition products will be global problem. On the other hand, world trends are directed towards providing not only sufficient quantities of food but also that food is adequate and satisfactory in regard to the quality. Genetic progress offers solutions for satisfaction of needs by use of genetically modified organisms (GMO), but on the other hand, consumers and consumer organizations are against their use.

Macedonia, in spite of its potential for development of agriculture in general, including livestock production, is considered as country which can not satisfy its own needs and has to import food in order to cover the needs of the population..

Livestock production in developed livestock breeding countries participates in general agriculture with high share. In Austria, livestock production participates in total agriculture with 67%. In Switzerland cattle breeding participates in total production with 53% (33% in milk production and 20% in meat production). In the Netherlands cattle breeding participates in livestock production with 68%, in Germany with 64%, whereas in total agriculture with 44%. In Finland cattle production participates in livestock production with 63%.

In Republic of Macedonia, cattle breeding in livestock production participates with 24,5%, and livestock production in total agriculture with 35,3%. Characteristics of Macedonian livestock production are small farms with 2 to 3 cows per farm (75% of total number of farms) and small land property (80% of farms with 1 to 3 ha).

Key words: cattle breeding, current situation, perspectives, genetic improvement

Some characteristics of livestock production in Macedonia

Livestock production in Macedonia in general has the trend of decrease in recent years.

Table 1. Livestock production in R. of Macedonia

	2000	2001	2002	2003	2004	2005	2006
Livestock inventory/Number of livestock							
Cattle	264.968	265.266	258.973	259.976	254.803	248.185	255.430
Sheep	1.250.686	1.285.099	1.233.830	1.239.330	1.432.369	1.244.000	1.248.801
Goat		78.542	81.439	71.810	67.786	62.190	
Pigs	204.135	189.293	196.223	179.050	158.231	155.753	167.116
Poultry	3.713.369	2.749.637	2.900.966	2.417.362	2.725.298	2.617.012	2.585.327
/Honey-bee	75.481	70.869	70.088	71.602	69.036	66.738	67.804
Proizvodnja							
Beef/Young beef meat (tons)	7.287	5.835	6.738	8.691	8.824	7.604	7.132
Cow milk (000 l)	220.244	200.904	198.431	191.533	212.898	197.464	234.708
Sheep milk (000 l)	40.156	47.486	51.626	52.466	47.876	48.700	56.582
Pig meat (tons)	9.323	8.413	10.626	9.609	9.373	8.897	8.633
Poultry meat (tons)	4.840	4.702	3.992	4.116	3.189	3.809	3.903
Sheep and Goat meat	4.919	5.789	4.637	5.895	7.030	6.857	7.198
Eggs (000)		395.000	345.000	283.000	340.000	340.000	330.546
Wool (tons)	1.920	1.917	1.914	2.003	3.176	1.791	2.106
Honey (tons)	1.087	982	853	1.026	916	1.042	868

Source: National strategy of agriculture and rural development in period 2007-2013

Weaknesses and strengths of Macedonian livestock production and opportunities

Weaknesses

Small farms with predominant technology with low input and output expenses;
 Low productivity;
 Low production specialization;
 Poor vertical connection between farmers (producers) and processors who have dominant position;
 Poor production practice and low quantity and quality of products due to poor management and low skills of farmers;
 Low processing capacities with EU export license;

Lack of market standards;
Lack of forage food and high share of concentrates in animal nutrition;
Poorly developed extension service;
Discontinuity in realization of adopted selection programs and absence of incentives for competent institutions (Ministry of Agriculture and government);
There is no national coordination body, link between farmers – processors – government;
Lack of governmental measures which would regulate the surplus of produced products.

Strengths

Favourable ecological conditions for development of livestock production;
Great surfaces for pasture of all animal species and possibilities for production of livestock food;
Long tradition in livestock production;
Presence of local/indigenous species of domestic animals adapted to conditions in Macedonia and possibility for the improvement of their traits;
Presence of several traditional dairy products and possibility of their "creation of brands";
Presence of products which are recognizable for domestic and foreign market (Macedonian lamb);
Great demand for domestic agricultural products;

Opportunities

Increase of production per unit – head/surface;
Increase of market value of agricultural/livestock products by their processing into final products, improvement of their quality, brands, etc.;
Improvement of the quality of natural resources (natural pastures, etc.) and their maximum utilization;
National campaign for promotion of Macedonian products on domestic and foreign market.

In regard to the number and intensity of cattle production, farmers in RM can be divided into three categories:

Traditional farms – rear 1-5 cows and have low productive cattle with low production of 2000-3000 kg of milk/head and 120-150 kg of meat/head.

Family farms - with 5-20 cows and annual production of 4000-5000 kg of milk or 40-50 fattening cattle.

These farmers should be carriers of the development of cattle breeding in Macedonia, and be integral part of economical and stimulation measures of our state.

Specialized dairy and fattening farms – have over 50 heads, with mechanized production process and annual production of 6000-8000 kg of milk or daily gain in fattening cattle of 1200-1400 g/day and final weight of cattle from 450-600 kg.

Production of beef

Production of beef and rearing method are closely related to natural resources for this type of production. Quality of produced meat greatly depends on type of rearing and production system.

Republic of Macedonia is traditional importer of beef. The most frequent rearing method in country is system cow-calf, but breed structure as well as number of heads of cattle included in this rearing method is insufficient (*Palaševski, 2007a*).

Table 2. Total number of cattle – number and breeds (2007)

BREED	NUMBER OF ANIMALS	%	1999 - 2000
Buffalo	100	0.03 %	
Busha	42.400	14.29 %	≈ 54 %
Other and crossbreds	82.897	27.95 %	
Brown Swiss	16.083	5.42 %	≈ 13 %
Oberental cattle	1.297	0.44 %	
Simmental	19.899	6.71 %	≈ 13 %
Fattening breeds	120	0.04 %	
Holstein-Friesian	133.838	45.12 %	≈ 19 %
TOTAL NUMBER	296.634	100 %	

Source: Veterinary directorate of Republic of Macedonia

Big farms are most often carriers of the biologically valuable genetic potential which is generator of certain genotypes. In regard to cattle breed structure dairy breeds are at the first place.

Improvement of the breed structure in Macedonia is prerequisite for improvement of the production of beef. Advantage of the systematic rearing of fattening cattle is in decrease of labour and lower investment into facilities and equipment. Cheap production of beef is only possible if natural surfaces are used grasslands to provide cheap food.

Rearing of cattle for production of meat has certain advantages which are obvious in the following:

- fattening cattle breeds use pastures exceptionally well (cow-calf system) and need for capital buildings and facilities is lower;
- resistance to diseases of this cattle is much higher compared to dairy breeds;
- in meat production, one worker can rear 450-500 heads.

Total production of meat in Macedonia is 29.835 tons/year, of which 8.691 tons is beef (2004). According to data of the Macedonian Veterinary directorate, Macedonia annually imports approx. 16.000 t of beef. Consumption of meat per capita is 29,4 kg of which 9,2 kg is beef.

Table 3. Production and consumption of meat per capita in R.M (2005)

Year	Produced beef (t)	Produced beef per capita (kg)	Consumption of beef per capita	Provided by domestic production (%)
1997	6704	3.21	6.4	50.16
1998	7987	3.55	6.8	52.20
1999	7092	3.42	6.5	52.61
2001	5835	2.92	5.8	50.20
2003	8691	4.15	9.2	45.10
2004	8.824	4.21	9.5	44.54

Meat consumption should be part of modern human nutrition in very high share, based on scientific results. In developed countries, annual consumption per capita is 90-130kg of meat of which 35-40% should be beef. According to latest data, consumption of meat per capita is 90-100 kg i.e. 30 to 40 kg of beef.

Production and consumption of milk in Macedonia

1. Importance of milk production

In analysis of milk production in Macedonia, it should be considered that there are two different sectors: individual producers and big agricultural firms. Production of these agricultural companies represents market surplus and 99% of this production is placed on the market, whereas in case of individual farmers, one part of the milkproduced remains on the local market (raw milk or cheese), which is a problem in our country (*Palaševski, 2007b*).

Individual producers are main link of the Macedonian dairy industry. Recently, as a results of partial import, the breed structure of dairy cattle has been improved and at the same time the production of milk has been increased.

The majority of cows (95%) is owned and kept by individual farmers, and production of milk represents significant source of income. At the same time, number of cows per farmer is very low (75% of farmers have 2-3 cows), with undefined technological cycle which decreases the desired effect. On the other hand, big agricultural companies are carriers of biologically valuable genetic potential which is generator of desirable genotypes.

Table 4. Milk production in Macedonia between 1995 and 2004

Year	Total		Agricultural companies	
	in 000 liter	per milking cow, liter	000 liter	per milking cow, liter
1995	128825	1429	26962	4034
1996	133642	1406	25234	4124
1997	133308	1396	23073	4177
1998	173567	1902	22595	4446
1999	202387	2152	23097	2618
2000	220244	2343	23153	4855
2001	200904	2096	21434	4622
2002	198431	2094	20713	4833
2003	191533	2140	19314	4960
2004	212898	2362	19301	4627

Source: Statistical yearbook 1995 - 2004, DZS

In Macedonia, total consumption of cow milk shows no significant changes in analyzed period. In 2001 consumption of milk was the highest - 153.337 tons.

In 2006, total production of milk was 234,708 tons, which is by 18,9% more than in 2005.

Great part of the demand for milk and dairy products in Macedonia is satisfied by import. In average annually 8.021 tons are imported. In the analyzed period, from 1995 (maximum import of 13.467 tons) onwards, certain trend of decrease of the imported quantity of milk is noticeable. The lowest import was registered in 2001 - 4.023 tons. In following years import is again in increasing trend. The greatest import of cow milk was from Slovenia - 45%. Imported quantity was 5.768.273 litres in the value of 4.232.867 euros, followed by Germany with 17% or 2.126.246 litres in the value of 3.935.129 euros, 13% Croatia, Serbia and Montenegro 8%, and 5% from Czech Republic and Bulgaria, 2% Bosnia and Herzegovina and 1% Greece and France (*Antonov et al., 2001; Cmiljanic et al., 2006; Cobic et al., 1996*).

Beside stated characteristics of Macedonian cattle production, one of the unfavourable factors in our livestock production is high price of livestock food. This has very negative effect on final structure of milk and meat production, considering that livestock food participates in total production costs with 50-65%.

One of the prerequisites for production of sufficient quantities of industrially produced animal food, among other things, is to provide sufficient quantities of forages, especially those high on energy which participate in average with over 40% in final food. In total quantity of energy forages needed, domestic production can provide 80% and the remaining 20% are imported. On the other hand, bad years in crop production from the aspect of climatic conditions, quantities of energy feeds, especially corn, by far are insufficient and can not satisfy the needs of the livestock food industry.

Domestic production of livestock food and forage cultures satisfies 30-35% of national needs. In developed countries, percentage of cultivated land used for growing of forages is approx. 40%. Macedonia is importer of corn and other forage cultures. It is known that these cultures participate in production costs with 50-85%. According to data of the State Bureau of Statistics (Statistical report for 2006) Macedonia disposes with following land surfaces:

Table 5. Land surfaces in Republic of Macedonia in 2006

I	Total area in R.M.	25.713 km²
1.	Hills and mountain	79.0%
2.	Plains	19.1%
3.	Natural lakes	1.9%
II	Agricultura land (100%)	1.225.513 xa
1.	Agricultural land	43.85%
2.	Pastures	56.08%
3.	Swamp and fishery	0.08%

In total fore mentioned agricultural land surfaces forage cultures are present with only 8%. The most present is alfalfa, 18.218 ha with annual production of 125.832 tons. On land surfaces under meadows, 60.264 ha, yield of 106.814 tons of hey is realized, whereas on pastures - 687.324 ha, 518.705 tons were produced.

Table 6. Production of certain forage cultures in 2006

Culture	Area		Production	
	Crop lands	Harvested	Total / T	Kg /ha
Clover	3.635	3.618	16.951	4.685
Lucerne	18.218	18.114	125.832	6.947
Sweet vetch	2.410	2.399	10.822	4.511
Forage pea	1.521	1.418	6.624	4.672
Feed corn	2.241	2.241	48.916	21.828
Fodder beet	447	435	5.754	13.227
TOTAL	28.472	28.225	214.899	55.870

Total development of livestock production in one country is impossible without continuous education and training of workers included in the production. According to 2007 census, Macedonia is far behind other European countries in this regard.

Total number of workers in agriculture is 476.600, of which 98.8% work on individual farms, and only 1.2% in agricultural companies. Also seasonal hiring of workers should be included – their number reaches 109.900.

55.8% of workers in agriculture is without education (they work based on tradition which is not to be underestimated), but it is insufficient for modern approach and application of modern technologies. Assumption is that seasonal workers are also without elementary school education or incomplete education, which additionally makes the picture bad (*Angelov, 2008*).

Number of workers with high education is minor - 6.9%. Of this number, only 1.2% has agricultural education. This means that organizers and creators of the production of which the success of the production depends are without adequate education.

Total number of persons with MSc or PhD degrees who are working in agricultural sector is 384. Of this number, only 54 persons of this profile are employed in production companies, which is 1% of total number of workers, contrary to individual sector where this percentage is only 0.1%.

From all fore mentioned, it can be concluded that, serious reason for low yields, non-competitiveness and insufficient utilization of capacities, few production companies with introduced safety standards, poor product marketing and production in general, beside other factors can also be in insufficient education in agricultural production in Macedonia.

Perspectives in development of cattle breeding in Macedonia

By implementation of certain measures it is necessary to stop the decline of livestock production with increase potentials and tendencies. Considering that in livestock production, and especially in cattle production, reproduction is long and complex, genetic improvement and progress are long and hard process, and obtained results can be rapidly destroyed. Therefore, in livestock production a long term and unambiguous policy of development is necessary which will be supported by the government.

For the purpose of defining of development objectives, the following is necessary:

- ✓ Determine the number of heads on 100 ha of agricultural land;
- ✓ Harmonize the production of livestock products with objective needs of the population;
- ✓ Provide necessary forage basis from own resources, by application of modern agro-technical measures;
- ✓ Define development areas/region (although in Macedonia there is, in certain way, already established regionalization);
- ✓ Apply new technologies in livestock production and processing facilities;
- ✓ Improve livestock production by introduction of quality control systems (HACCP, GAP, etc.) and in direct support by the state for export oriented production subjects. All this is potential for satisfying of own needs and potential export of our products;
- ✓ World experiences show that process of livestock production according to system "FROM FIELD TO FORK" is synchronized process in all stages of the cycle. In our country this synchronization is missing.

All mentioned directions should be studied and introduced into long term program with clearly defined development directions and, of course, supported by the state.

Stanje i perspektive govedarstva u Republici Makedoniji

B. Palaševski, Z. Naletoski, N. Mateva

Rezime

Nedostatak hrane, posebno nedostatak proteina u ovom milenijumu biće glavni problem u mnogim zemljama, posebno u onim u razvoju. Zadovoljavanje potreba čovečanstva sa neophodnim hranjivim produktima predstavljaće problem u svetskim razmerama. S druge strane, svetski trendovi su usmereni ka tome da se

hrana obezbedi ne samo u dovoljnim količinama, već i da zadovoljava i po svome kvalitetu. Genetski napredak, s jedne strane možda i nudi rešenja o zadovoljavanju potreba sa upotrebom genetski modifikovanih organizama (GMO), ali na drugoj strani su potrošači i organizacije koje se protive ovoj upotrebi.

Makedonija, i pored svog potencijala za razvoj ukupne poljoprivrede, tako i stočarstva, spada u zemlje koje ne zadovoljavaju vlastite potrebe i veliki deo svojih potreba pokriva uvozom.

Stočarska proizvodnja u razvijenijim stočarskim zemljama učestvuje visokim procentom u ukupnoj poljoprivredi. U Austriji, stočarstvo u ukupnoj proizvodnji učestvuje sa 67%. U Švajcarskoj govedarstvo u ukupnoj proizvodnji učestvuje sa 53% (33% u proizvodnji mleka i 20% u proizvodnji mesa). U Holandiji govedarstvo u stočarskoj proizvodnji učestvuje sa 68%, u Nemačkoj sa 64%, dok u ukupnoj poljoprivredi sa 44%. U Finskoj govedarstvo u ukupnoj stočarskoj proizvodnji učestvuje sa 63%.

U Republici Makedoniji, govedarstvo u stočarskoj proizvodnji učestvuje sa 24,5%, a stočarska proizvodnja u ukupnoj poljoprivredi sa 35,3%. Karakteristike makedonskog govedarstva su: male farme sa 2-3 grla/farmi (75% od ukupnog broja farmara) i mali zemljišni posed (80% su sa posedom od 1-3 ha).

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