

Efficiency, cooperative aspects and prospects for dairy and beef sectors in Macedonia

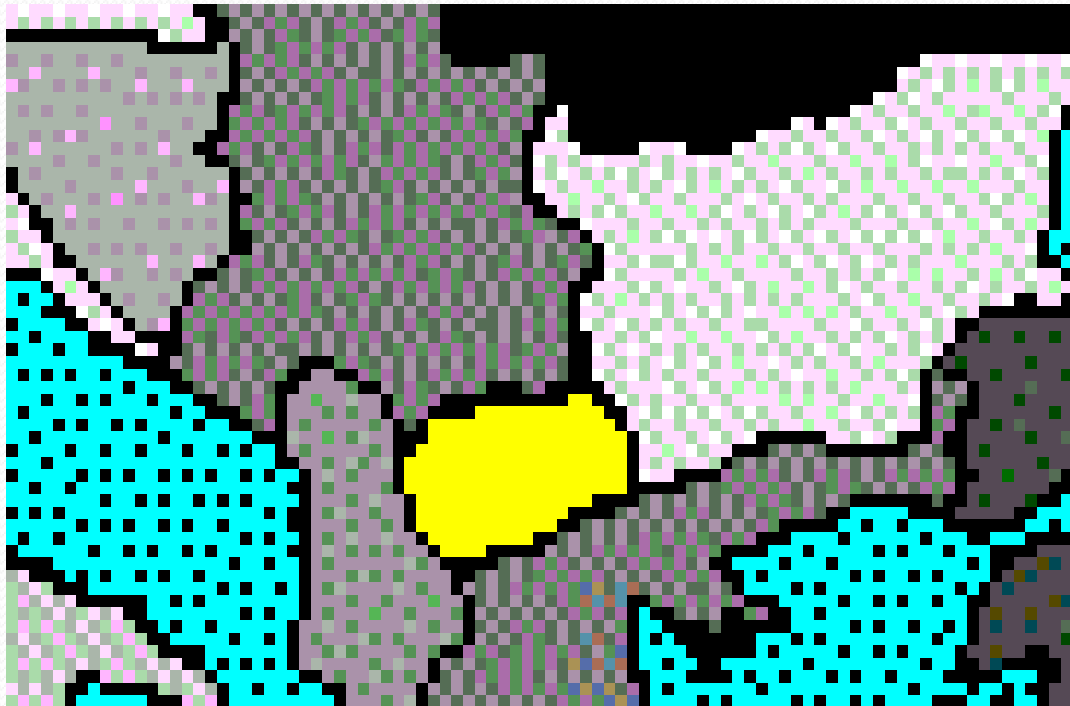
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Regional position of Macedonia



Physical conditions of the R. of Macedonia



- Area: 25.713 km²,
- Population: 2.100.000,
- Climate: 3 kinds (mediterranean, continental, high mountain),
- 2/3 is hill-mountain area,
- highest mountain: Korab (2864 m);
- main river: Vardar;
- 3 bigger lakes: Ohrid, Prespa and Dojran;
- mountain borders for climate maintaining;
- 3 river flowing basins: to Aegean, Adriatic and Black sea;

- Temperature: average 11,5 °C (0,3-22,2) extreme from -31,5 to +44,5 °C;
- Rains: 680 mm/year;
- Sunshine annual quantity: 2100-2450 h;
- Altitude: average = 829 m (70% up to 1000 m);
- Soils: delluvial and alluvial, red, brown and salty soil;
- Nationality: Macedonian (67%), Albanian (21%), Serbian (3%), Turk (1%), Greek, Bosnian, Romanian, Bulgarian, etc.

Physical conditions of the R. of Macedonia

The climate and relatively good soils (two-thirds of the arable lands are vertisols and terra rossas) and offer comparative advantage for accomplishing high yields in agricultural production, if irrigation is provided. Half of the territory (50.8%) is used for agriculture, split almost equally between arable and pastures. Very fertile land is scarce and only 7% of arable land is classified in classes I to II while 82% are in classes VI to VII. Because of the steady decline in rural population since 1948 (-30%), it is reported that fallow has increased ha in the recent years (193'000 ha or 35.1% of the arable land) (Annual Yearling of RM, 2011).

- A cattle breeding in the R. of Macedonia (FYROM) is in very strong competition with vineyard, vegetable and fruit production, from one side, and with small ruminant production on hill-mountain area, in the other side.
- R. of Macedonia is 2/3 a hill-mountain country, with 6 basic agricultural regions, and 52 sub regions, with 3 kinds of climate (mediterranean, continental, high mountain).
- Because of the small average od cattle per farm (3,5), small milk yield per cow (2880 kg/cow), with the average 3,5 lactations per cow and unstabled state subsidy policy, it is very hard to face with the regional and global policy of cattle production. The domestic beef production for many years vary between 7-9.000 t/year, which supply 35-50% of the total state demand of beef. Facing with the development od the other agricultural branches in the present situation, dairy and beef production is in a dificult situation, with the tendency of decreasing of the number of farmers, cattle and arable land, but with a slow increasing of the farm capacity and dairy/beef yeald per head.

Economy of Macedonia:

- Low annual income per head: 2000 US\$;
- large unemployment (40%???)
- bad and fast process of privatization;
- ruining of the large enterprises and state farms;
- movement from villages to towns (from '70s ???);
- bad credit opportunities, high bank interest, taxes, very variable market “demand-supply”.
- Still traditional agricultural country, with intensive agriculture in the valleys, semi-intensive and extensive in hill-mountain region;

Macedonian surface area and population

<i>Agricultural land</i>	<i>1.244.000 ha</i>	<i>49,2%</i> <i>from total</i> <i>land</i>
Pastures	658.000 ha	50,8%
Areable land	610.000 ha	49.2%
<i>Woodland</i>	<i>997.000 ha</i>	<i>38,8%</i>
<i>Swampland</i>	<i>330.000 ha</i>	<i>12,0%</i>
Population employed in agricult.	226.498	11,6%
Inhabitants per km ²	76	
Population in rural area		39%
under systems of irrigation of agricultural land	370.000 ha	24,5%
domestic originated water capacity	84%	

2. Land distribution and farming structures

- The arable land is shared between State enterprises and small private farmers: 52% of the households have less than 0.5 ha, and 35% 0.5 to 3 ha, 11% 3 to 5 ha; 80% of the households depend on less than 2 ha (Annual Yearling of RM, 2010). Larger private professional farms are rare and agricultural activity is more an extension of households where members are employed off farm and the farms operated by labour of the extended family, especially women.
- Grazing pastures in their turn are mostly socially (73%) managed and many farmers have access to the communal summer grazing pastures in hills adjacent to their village.
- Agri-combinates still play an important role in agriculture as major employers in rural areas, monopolistic distributors of farms inputs and purchasers of farm out puts, in the absence of alternative market channels.
- Agriculture accounts for 15% of the labour force but 39% of the population lives in rural areas and their existence is closely linked to agriculture. Individual agriculture is the symbol of economic independence of the villagers.

● CROP PRODUCTION:

● wheat (pcenica)	288.328 t
● Rye (jacmen)	9.420 t
● barley (oves)	109.416 t
● oat (maslinki)	2.675 t
● corn (pcenka)	134.334 t
● rice (oriz)	14.588 t

- 62% of the arable land is used for cereal production, with more than half for maize. The yield (25 dt/ha) is considered as low. Macedonia produces also rice with a fairly good yield (54 dt/ha). After the loss of the Yugoslav market, a shift in took place from vegetables to barley and alfalfa for livestock support. Vineyards is an important tradition in Macedonia and are cultivated intensively, mainly in Povadarie and Pelagonija Polog. Tobacco is entirely oriented towards export and the satisfaction of tobacco industry.

4. Livestock

- ★ *AUTOHTONOUS BREEDS:*

- ★ *Cattle: Busha (3 strains), Buffaloes???*

- ★ *Horse: Macedonian hill-mountain breed;*

- ★ *Pig: shishka;*

- ★ *Goat: balkan pied;*

- ★ *Sheep: pramenka (sarplaninska, ovcepolska, karakacanska);*

- ★ *Fish: Ohrid trout;*

- ★ *Dog: sarplaninec;*

- ★ *Eagle: white-head eagle; etc (pelican, fox, deer).*

4. Livestock

- The livestock number in Macedonia is relatively small with 256.000 cattle heads, 680.000 heads of sheep, 255.000 heads of pigs, 31.500 heads of horses, 150.000 heads of goats and 2.264.000 heads of poultry. From the total livestock production, traditionally only lamb meat production is export oriented and local requirements are met with imported products.

5. Cattle production

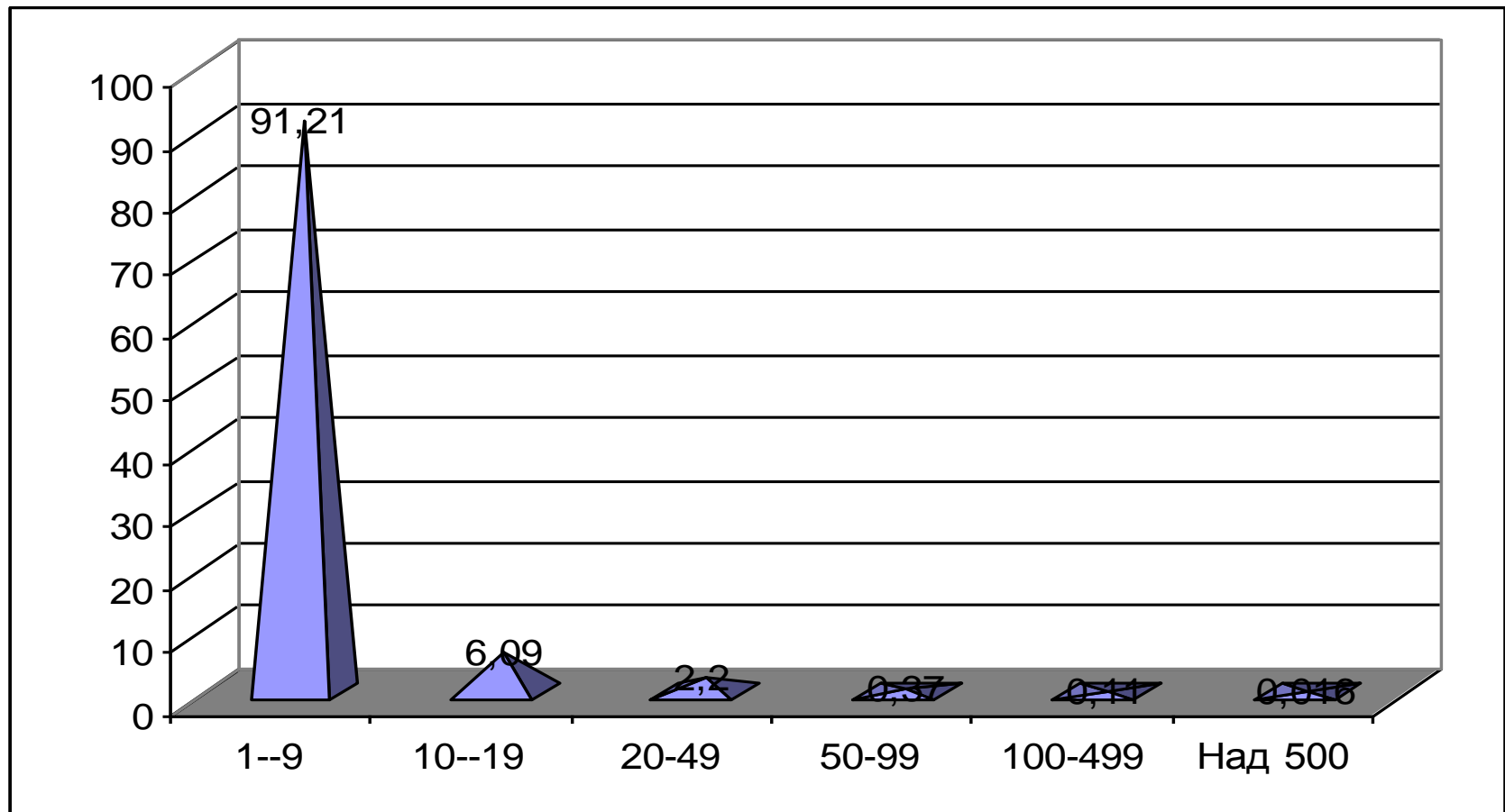
- Cattle production is still the leader livestock branch in the state. Such as in every state in transition, all the changes and fluctuations of transition influence a lot on dairy and beef production in the state.
- The total number of cattle in the last several years is relatively stable (tab. 1)



Tab. 1 Total number of cattle and cows with pregnant heifers in the period from 2006 till 2010 (Statistical Annual Report of the R. of Macedonia, 2011)

Year	Total no. of cattle, heads	Total no. of cows and pregnant heifers
2006	255 430	164 013
2007	253 766	143 217
2008	253 473	147 519
2009	252 521	128 628
2010	259 887	135 004

- Individual farmers possess a small number of cattle per farm. In December 2010, in the R. of Macedonia there were totally 45.127 registered dairy producers, from which 91% were farmers with the average with 1 to 9 cows per farm (graph. 2).



5. Cattle production



- According to the basic statistical data from the Ministry of Agriculture from 2010, in the R. of Macedonia there were 87 registered dairy plants, which annually processed around 150.000 tons of milk. From the other side, from totally 45.127 dairy farmers, only 11.000 farmers (24,33 % i.e. one of four farmers) has delivered his milk to the milking plant.
- The larger dairy farms with more than 200 cows per farm, are still the nucleus of high-performance cattle, mainly for Holstein breed of cows (tab. 3).

- *Tab. 3 No. of cattle by breeds in the R. of Macedonia in 2008, 2009 and 2010 (Ministry of Agriculture, Forestry and Water Utilization, 2010)*

Breed of cattle	2008		2009		2010	
	No.of heads	in %	No.of heads	in %	No.of heads	in %
Black and white	101843	41,80	109525	42,49	112012	41,57
Simmental	12310	5,05	13778	5,35	14068	5,22
Brown	9437	3,87	10334	4,01	10201	3,79
Grey Tyrol	674	0,28	689	0,27	685	0,03
Domestic cattle Busha and crosses in its type	29535	12,12	27990	10,86	27242	10,11
Beef breeds	64	0,03	264	0,10	158	0,06
Crosses	89707	36,82	94934	36,84	104961	38,95
Other breeds	97	0,03	210	0,08	116	0,27
Total no. of cattle	243667	100,0	257724	100,0	269443	100,0

5.1. Development of cattle breeding in RM

- *Tab. 4 Phases (periods) of development of cattle breeding in RM*

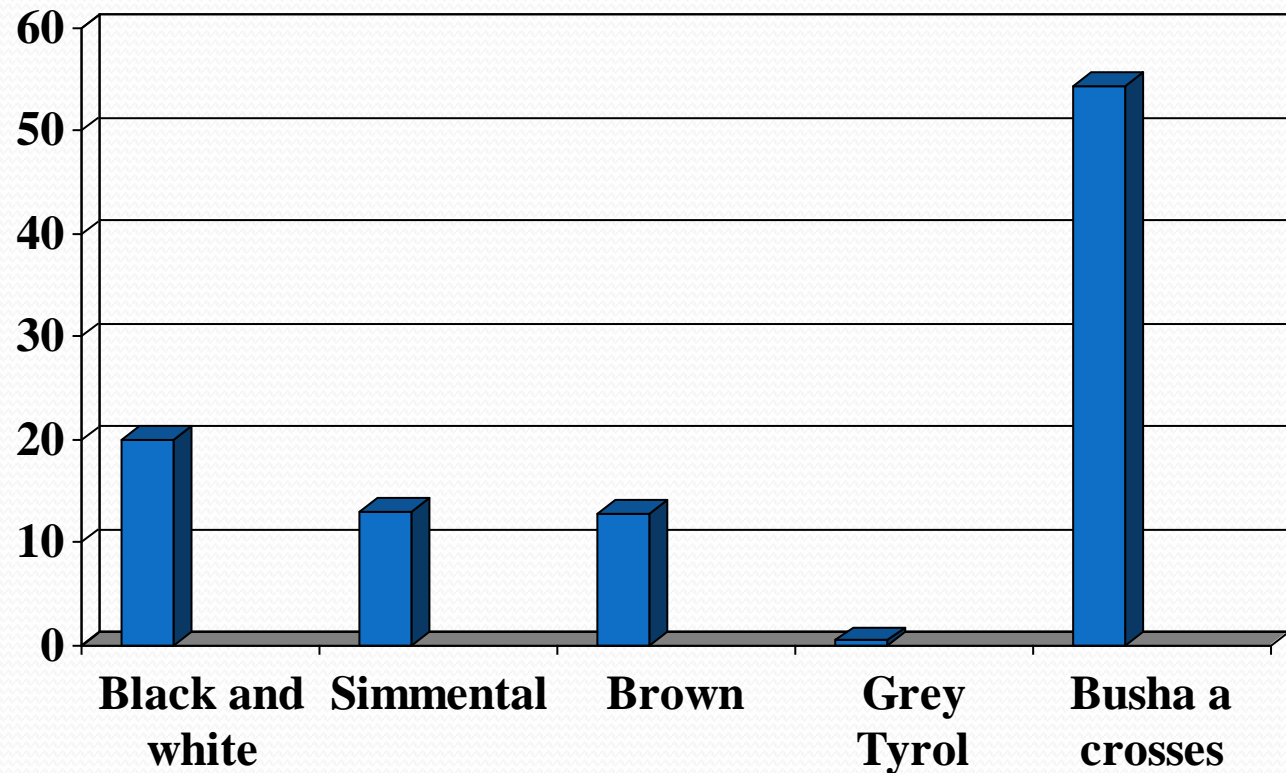
Periods	Features of cattle breeding
Until 1950	Mainly breeding of primitive breeds of cattle, mainly in Busha type and its crosses, with low production per head
From 1950 to 1991	Establishing the state agrocombinates with their larger dairy and beef farms. Book recording was established only for the state cattle farms. They were market oriented and controlled on their productive and reproductive performances. In the individual (private) sector was given a small attention for development.

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5.2. Types of cattle farmers in the R. of Macedonia

- According to the number of cows per farm and the level of intensive production, there are three basic types of cattle farmers:
- Small farmers, with traditionally rearing of low productive breeds of cattle, with low input, keeping 1-3 cows with the annual production of 2000-2500 kg milk per cow. They have to transform in the second type of farmers (according to the economical, property, sociological and other conditions) because they are not a market oriented farmers.
- Family farming, with the average of 10-15 cows per farm and the annual production of 4000-5000 kg milk per cow. They have a medium input in farming. Mainly they are mixed farmers, with a different agricultural production and different sources of income. This type of farmers ought to be the base of the state supporting measures.
- Specialized dairy and beef farmers, with the capacity more than 50 cows per farm, with high input, higher milk production with more than 7000 kg per cow. Their number in R.Macedonia is small, but they have to be reproductive centres (nucleus) for spreading the genetic material for the other commercial cattle farmers in our state, for which purpose they have to be stimulated by the state.

Breed structure: Black and white 19,40%, Simmental 12,88%, Montafon (Braunvieh) 12,95%, Oberintal (Grey Tyrol) 0,50%, Busha 54,31%;



Black and white breed



Simmental breed



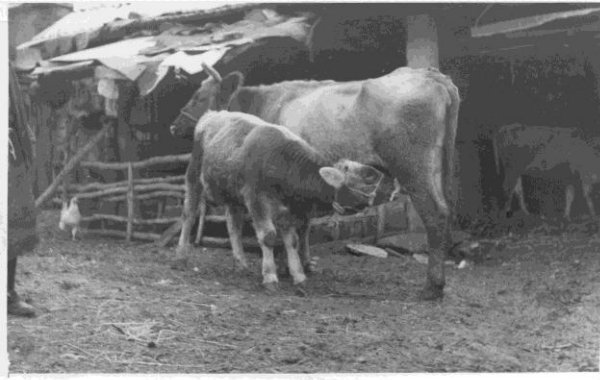
Brown (Montafon) breed



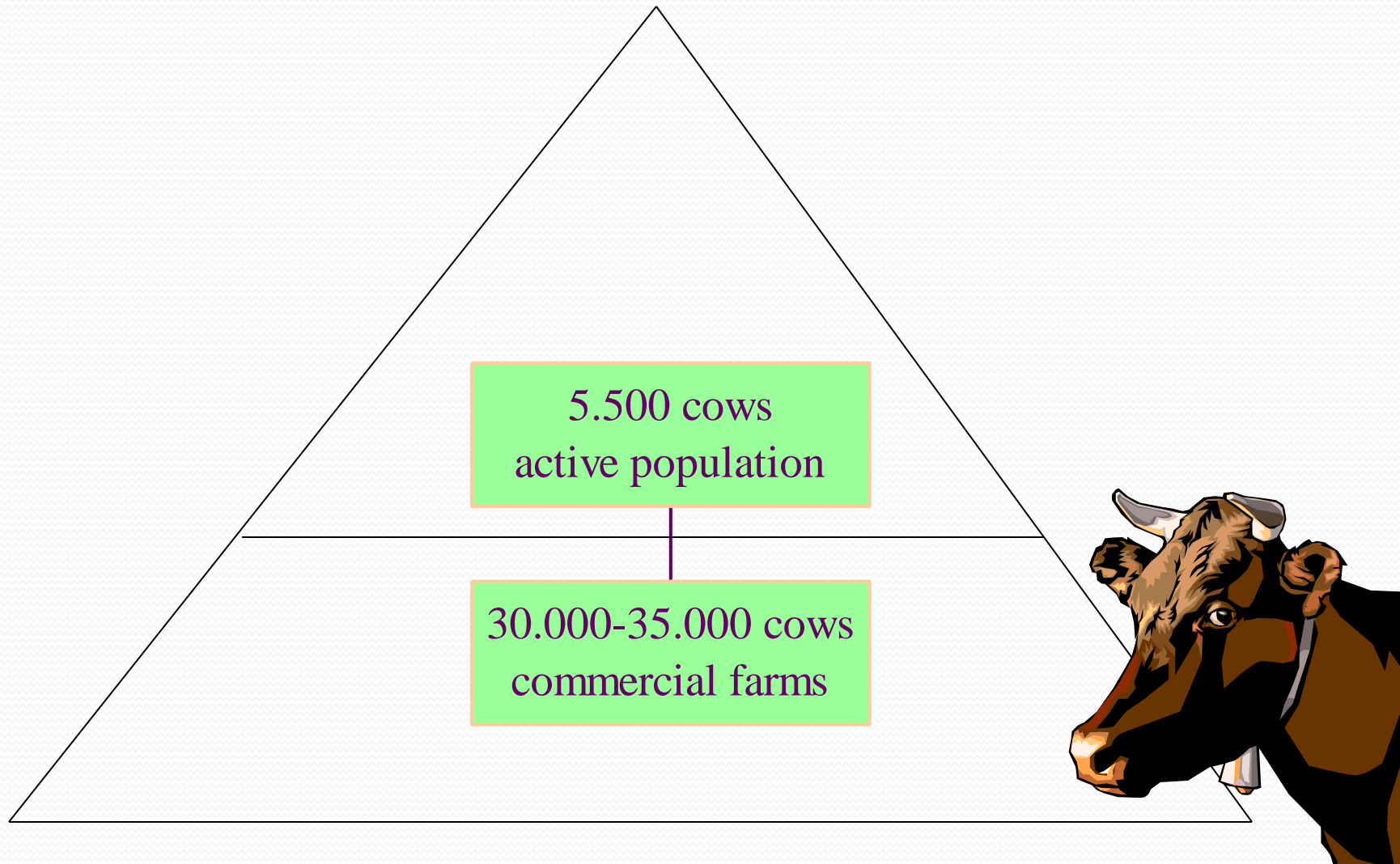
Grey Tyrol (Oberintal) breed



Busha (domestic breed)



Breeding pyramid for black and white population in Macedonia



Evidence in nucleus:

1. Basic data;
2. Morphological data;
3. Conformation traits;
4. Production traits;
5. Reproductive traits.

★ Since last year a new system of milk price has been established:

● **Price of milk = (M x mc) + (P x pc) + K**

M – fat content (%);

P – protein content (%);

mc - price per 1% of milk fats;

pc – price per 1% of milk proteins;

K – Correction factor, depending on the number of somatic cells (2 degrees), number of bacteria per ml (5 degrees).

Weighing factors in price: 60% on protein, 40% on fats.

5.3. Dairy production and consumption

- Total milk production in the recent several years is increasing, with the average annual cows milk production of 350.000 t, which takes 85% from the total milk production in the state. From the other side, the average milk production per cow on the national level in the last several years in RM is approximately 3.000 l/cow, which is relatively low, comparing with the average in the other Balkan and European countries.

• *Tab. 5 Total milk and cow milk production, percentual part of cows milk in total milk production, and the average milk yield per cow in the last several years in the R. of Macedonia (Annual Statictical Review of RM, 2011)*

Year	Total milk production, in 000 kg	Total cows milk production, in 000 kg	Perannual part of cows milk in total milk production in RM, %	Average milk yield per cow, in kg
2006	291290	234708	80,57	2497
2007	438168	373706	76,92	2880
2008	438069	368217	84,05	2835
2009	394942	342622	86,89	3004
2010	394334	347103	88,02	2787

- According to the average milk and meat consumption per household in RM in 2010, the average is 156,9 kg of cows milk, 33 kg beef, i.e. approximately 39 kg milk per head and 10 kg beef per citizen.

- *Tab. 6 Cows milk consumption per household and per capita in RM from 1995 till 2010*

Year	Average milk consumption per household, in kg	Average milk consumption per capita, in kg
1995	259.5	62.7
1996	249.9	59.8
1998	258.7	64.1
2000	249.6	63.6
2002	244.2	61.3
2004	204.9	52.1
2007	187.0	47.2
2010	156.9	39.1

5.4. Beef production and consumption

- *Tab. 7 Total no. of slaughtered cattle by categories from 2006 till 2010 in the R. of Macedonia (Statistical Annual Report of the RM, 2011)*

Year	Total meat production in RM, t	Total beef production, t	Percentage (%) of beef in total meat production in RM
2006	28041	7132	25,43
2007	27228	7121	26,15
2008	25065	7018	27,99
2009	25362	7307	28,81
2010	23271	6082	26,14

- According to the official statistics, in 2012, 7605 t of beef were imported in our country, as raw or frozen, for which were spent 23.753.000 US\$, or 0,4% from the total import products in RM (Annual Statistical Review of RM, 2011). It is obviously that the domestic beef production has to be forced with the government subsidy policy, with the main objective to reduce the dependance of beef from the import.

- *Tab. 9 Beef consumption per capita in the RM from 1995 till 2010, in kg Macedonia (Annual Statistical Review of RM, 2011)*

Years	1995	1999	2001	2003	2005	2010
Beef consumption, kg	14.647	12.354	14.601	18.750	19.812	19.219

5.5. Milk control and book recording of cows in RM

- In the last two years, in our country only 10 larger farms with totally 6000 cattle or 3000 milking cows, are under milk control and book recording, mainly of black and white breed of cattle.
- Controlling of milk production is realised according to the official methods by ICAR regulations.

- *Tab. 10 Productive results in milk production of controlled cows in 2011*

Parameter	Average milk production per cow, kg	Corrected milk production per cow on III lact., kg	Milk fats, %	Milk proteins, %	Dry unfatted matters, %	Milk density
Average, kg	6170,82	6639,3	4,05	3,63	9,66	1,0325
Min	2815,2	2856,7	3,25	2,86	8,12	1,0256
Max	11863,1	12549,4	5,15	4,23	11,33	1,0368

5.6. Market of cattle, milk and beef

- In our country the market of cattle is realized in the following ways:
- Purchasing and selling of cattle on farms,
- Purchasing and selling of cattle on livestock markets, and
- Purchasing of cattle by importing, but a very low number of cattle is exported from the country.
- In the R. of Macedonia there are several livestock markets for cattle (in Skopje, Kumanovo, Prilep, Tetovo, Strumica, Struga and in the area of the larger villages).

5.7. Basic summary aspects of cattle breeding in the R. of Macedonia

- In RM there are several favourable and several limitation factors for the development of cattle breeding. As a general limitation factor is the high price of the produced forage crops in our country (even half of our total agricultural land are pastures, and a limited amount of arable land), from one side, and a low purchasing and unstable price given by the milking plants, from the other side.

- *Tab. 11 Favourable and unfavourable factors for cattle development in RM*

1. Favourable factors

- favourable environmental and ecological conditions for cattle production,
- relatively large agricultural land (51%) for grazing and crop production,
- a long tradition in cattle production,
- local breeds of cattle are well adapted in our environmental conditions,
- quite enough labour force (cheap),
- producing a traditional dairy and meat products, etc.

1. Unfavourable factors

- a lack of education of farmers for farm management (especially small farmers),
- a lack of state support by the extension services from the Ministry for farmers,
- a lack of longterm state policy in selection and reproduction programmes,
- a variable state policy in subsidy supporting,
- a lack of solution by the state for solving the sufficite of milk (during spring and summer), by processing and storage of longterm dairy products,
- breeders associations still do not take their role in breeding policy according to the national breeding programmes,
- there are still large imports of cheap dairy and beef products from EU and third countries with a different quality, because of the lack of state regulatives for market controlling,
- a lack of progeny testing stations for bull producing aimed for A/I, and importing of semen by young bulls or bulls in test, etc..

1. Unfavourable factors (continuing...)

- small farms with small input and output costs,
- a lack of specialization in dairy or beef production,
- a lack of forage crops by quality and quantity (7% from arable land), with low yield (755 kg hay/ha on pastures - 687.324 ha i.e. 1772 kg hay/ha in meadows - 60.264 ha),
- high costs of concentrate crops for cattle, uneconomical use, and large import of concentrate,
- in the hill-mountain area of RM, which is 2/3 from the total land, there is a lack of expert arrangement, without agrimeliorative measures and irrigation systems, with a consequence of low and extensive production,
- early slaughtering of the cattle offspring,
- small land property per farm,
- a lack of vertical integration between farmers and processed industry, where the processed industry still has a dominant role,

6. Conclusion

- In our country, without a longterm policy for cattle breeding, because of the slow development in cattle production, it is impossible to create a stable cattle selection and production, according to the international standards and controlling. Only by a quality realization of the breeding programs and using contemporary methods of control, estimation, ranging and selection of cattle in our country, it is possible to have prosperity. By using a recent knowledge in management, reproduction, population and molecular genetics, sophisticated programs and permanent learning of humans, it is impossible to achieve a spread development of cattle production in our country.

Perspectives of Macedonian agriculture:

- Ecological clean land for eco-agriculture;
- mixture of nations, religions, climate, cultures, etc.
- brave organizing of farmers in Associations;
- useness of domestic products: cheese, meat, fruit, vegetable, grape, vine, rakija, salates (mixed with folklore and domestic music);
- various rural specialites (paradise, paper, ajvar, punene paprike, sarma, gravce v tavce, pastrmajlia, zelnik, pogace, selsko meso);
- peacefull and calm people with a huge hospitability.
- Mother Thereses' words: "world is not poor in money, but for love and happiness".

Thanks!

