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# BUFFALOES, MINIMUM INVESMENT OPORTUNITY WITH CONSIDERABLE PROFIT

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## INTRODUCTION

Romania is currently the second country in Europe, after Italy, in what concerns the buffalo breeding, even though the number dropped from 56.263 in 2003 to 19.401 in 2016.

Buffalo exploitation in Romania is found at the limit that separates opportunity from disappearance, and concerns of avoiding a disaster are emerging. The bases of these concerns are the milk, especially dairy products of outstanding quality, even unique in the world (as in the case of Mozzarella cheese), the community and budget support for buffalo breeders, and last but not least the lower exploitation costs as for other species, for example cattle, all in relation to the growth area.

The tradition of buffalo breeding in Bihor county comes from distant times, the breeders of this species being poor people that used buffaloes in two purposes approximately equal between them: for milk production and for work.

The growth area of buffaloes in Bihor county is found in the hills area in the south-eastern part of the county, where predominant soils were brown and podzolic, with shoddy and even acidic pastures.

Following observations, studies and research made along the 37 years of professional activity it can be determined that the buffalo breed represents an investment opportunity with considerable profit and it is addressed to the actual and potential breeders.

## MATERIAL AND METHOD

The information regarding the evolution of the buffalo herds, the characteristics of reproduction and production of the Romanian buffalo breed, the chemical and energetic composition of buffalo milk and of the meat were taken out of the County Office for zootechnics (OJZ) Bihor, the Agricultural Directorate (DA), the Agency for Payments and Intervention in Agriculture (APIA) Bihor, bibliographic summaries and personal research.

To be noted that I worked 8 years in the improvement and breeding in zootechnics (OJZ Bihor), 25 years in DA Bihor and 4 years at APIA Bihor, and for 37 years, in between 1979-2016, I paid particular attention to the buffalo breed that I considered to be a species that is worth protecting and exploiting in Romania and Bihor county.

**RESULTS AND DISCUSSION**

The total buffalo herd has registered a sinuous evolution beginning with 1919 (145.856 heads), reaching 200.000 heads in 1945, with a maximum of 228.000 in 1980, after which the breed enters a continuous decline: 50.689 in 2005, 43.359 in 2008, 28.874 in 2010 and 19.401 in 2016.

The current area of Romanian Buffalo breed (approved in 1987), contains 3 centers: Transilvania, Campia Dunarii and Dobrogea. In present 97% out of the buffalo herd is to be found in Transilvania, on the valleys of Olt, Mures and Cris rivers (predominant in the Bihor, Bistrita Nasaud, Brasov, Cluj, Salaj and Sibiu counties).

Buffaloes growth area in Bihor county contains 3 areas: Alesd with 13 UATs (Alejs, Astileu, Auseu, Borod, Bratca, Bulz, Ineu, Magesti, Suncuius, Tetchea, Tileagd, Vadu Crisului and Varciorog), Beius with 16 UATs (Beius, Budureasa, Buntesti, Cabesti, Carpinet, Campani, Curatele, Draganesti, Finis, Lazuri de Beius, Lunca, Pietroasa, Remetea, Rieni, Vascau and Uileacu de Beius) and Ceica with 8 UATs (Ceica, Copacel, Dobresti, Dragesti, Hidiselul de Sus, Lazareni, Pomezau and Sambata).

The evolution of the total buffalo herd in the Bihor area of exploitation was a dramatic one: 15.678 heads in 1990, 6.576 in 2005, 4,784 in 2008, 2.112 in 2010 and 1.987 in 2016, fact which entitles me to say that the buffaloes are at the limit between opportunity and disappearance.

The investment opportunity of buffaloes is sustained by SCDCB Sercaia (450 heads), the buffalo farm in the town Mesendorf (Brasov county – 450 heads) and many individual households from counties: Bihor, Brasov, Cluj, Salaj and Sibiu that have between 20-50 heads /exploitation.

One of the arguments for the investment and exploitation of buffalo breed is the buffalo milk (1,2 Euro/Kg) which is superior to the cow milk and 4 times more expensive on the market.

In table 1 I present a bibliographical synthesis on chemical composition and the energetic value of milk in different species:

*Table 1*

Chemical composition and the energetic value of milk in different species: (bibliographical synthesis)

| No. | Specification % | Milk producing species | | | | |
|---|---|---|---|---|---|---|
| | | Buffalo | | Cow (Average) | Sheep (Average) | Goat (Average) |
| | | Average | Limits | | | |
| 1. | Water % | 82,5 | 81,5-82,6 | 87,5 | 82,5 | 87,8 |
| 2. | Dry Substance % | 17,5 | 17,4-18,5 | 12,5 | 17,5 | 12,2 |
| 3. | Non-fat Dry Substance % | 10,3 | 10,1-10,5 | 9,0 | 10,2 | 8,1 |
| 4. | Fat % | 7,8 | 7,5-8,2 | 3,8 | 6,7 | 3,7 |
| 5. | Total proteins % | 4,2 | 4,0-4,3 | 3,3 | 5,3 | 3,3 |
| 6. | Casein % | 3,4 | 3,3-3,6 | 2,7 | 4,3 | 2,8 |
| 7. | Lactalbumin and Lactoglobulin % | 0,6 | 0,6-0,8 | 0,6 | 1,0 | 0,5 |
| 8. | Lactose % | 4,9 | 4,8-5,0 | 4,7 | 4,7 | 4,5 |
| 9. | Minerals % | 0,8 | 0,7-0,8 | 0,7 | 0,85 | 0,75 |
| 10. | Energetic value Kcal\|Kg | 1145 | 1140-1150 | 700 | 1100 | 670 |

Concerning the chemical composition and the energetic value of the buffalo milk the following can be concluded:

- It has a big level of dry substance 17,5% (17,4-18,5%) and low in water
- Contains a very high fat 7,8% (7,5-8,2%) and lactose level 4,9% (4,8-5,0%), which raises the efficiency of the fat lactose products (cream, whipped cream and butter) and give a sweet taste
- Protein percentage is good 4,25% (4,0-4,3%), the milk is rich in casein (over 80%), which contributes to a high efficiency in making cheese
- FAO dates show the casein share ratio (26% casein α, 51% β casein and 23% γ casein, while k casein is not reported), and the lactoalbumin and lactoglobulin has the ratio as follows: alfa-lactoalbumins 2%, beta-lactoglobulins 39%, serice albumins 2% and imunoglobulins 20% (protease peptone are not reported)
- It has the biggest energetic (caloric) value (1.145 Kcal/Kg), but the variation is insignificant

Overall the sensorial and physical-chemical properties of buffalo milk differ from the ones of other milk-producing animal species. This has the color white, pleasant taste and high nutritious value. Buffalo milk is consumed in a fresh state after it is filtered and cooled at 4-6 ˚C, and it is very appreciated in some regions. This is also used for manufacturing of the much appreciated cheese (Buffalo feta, Mozzarella) and yogurt, often mixed with cow milk and good quality whipped cream, which is sought often by consumers.

The qualities and composition of the buffalo meat alongside the lower cost than for other species can be considered as elements that justify an investment in buffalo exploitation (table 2).

*Table 2*

Chemical composition of meat per breed
(bibliographical synthesis)

| No. | Characteristics | UM | Breed | |
|---|---|---|---|---|
| | | | Buffalo | Cattle |
| 1 | Energy | Kcal | 131,00 | 289,00 |
| 2 | Proteins (Nx6,25) | | 26,83 | 24,07 |
| 3 | Fat – Total | g | 1,80 | 20,69 |
| 4 | Fatty acids, out of: | | | |
| | - saturated | g | 0,60 | 8,13 |
| | - mono saturated | g | 0,53 | 9,06 |
| | - poli saturated | g | 0,36 | 0,77 |
| 5 | Cholesterol | mg | 61,00 | 90,00 |
| 6 | Minerals: Ca, Fe, Mg, P, K, Na, Zn, Cu and Mn | mg | 641,80 | 583,70 |
| 7 | Vitamins: C, B1, B2, B3, B5, B6, B9 ŞI B12 | mg | 20,95 | 18,52 |

From this data we can conclude:

- The energetic value of the buffalo meat is low, 2,2 times lower than cattle meat
- The total protein content is bigger at buffalo with 11,1 as for cattle
- Fatty acids concentration, especially mono saturated, is lower for buffalo
- The cholesterol is 1,47 times lower at buffalo
- The buffalo meat contains with 11% more minerals and 13% vitamins

The reproduction and production of the Romanian buffalo breed can be elements of reference when it comes to investment in a farm of buffaloes.

Evaluating the reproduction activity for buffalo, based on the information from OJZ Bihor, I could quantify achievement of the following indexes:

- The conception rate is between 50-70%
- Mattings numbers (IA) for a fertilize gestation varies between 1 and 4
- The natality is situated around 90%
- Service-period varies between 75 and 175 days, with a Average of 135 days
- Mammary rest, even if it has lower importance as for cows, is in Average 250 days
- Calving period varies depending on the age of the buffaloes and the way the breeding activity is organized, registering values between 480-600 days, Average 533 days

  In the milk production:
- The lactation period is short but variable (210-305 days)
- The milk quantity is variable (500-2500 Kg)
- The quality of milk is superior to cow (density 1,030-1,032, Average, water 82,5%, dry substance 17,5%, fat 7,9%, lactose 4,9, proteins 4,0% and minerals 0,7%)
- High biological value (84%)
- High ratio of fat in milk, until 8%
- Very good suitability of milk for manufacturing dairy products (whipped cream, yogurt and cheese – "Mozzarella", Homorod cheese, Buffalo feta, etc...

  In meat production:
- Live weight varies (300-600 Kg)
- Average daily gain (300-730 g/day)
- Food consumption /Kg gain 7-12 UN
- Carcase weight, generally until 200 Kg
- Variable cutting efficiency (45-53%)
- Different quality meat, depending on age, sex and fattening system

**CONCLUSIONS**

1. Buffalo milk represents a profitable investment opportunity
2. It has no cholesterol
3. It is 4 times more expensive as cow milk
4. It is successfully used for internal and bone diseases
5. Mozzarella cheese is unique in the world and is made out of buffalo milk
6. All dairy products out of buffalo milk are very sought on the market
7. The buffalo meat is tasty and with a very low cholesterol content
8. Buffaloes live 28-30 years and have an economical life of 15 years

9. The animals are not demanding about food
10. Buffaloes are among the healthiest animals, they have an auto protection to mad cow disease, brucellosis, leucosis and tuberculosis

**RECOMANDATIONS:**

Opening a buffalo farm that will ensure a considerable profit with minimum investment requires compliance with mandatory rules for a successful business:

1. Market research on the advisability of establishing the farm
2. The characteristics of the breeds that will be exploited
3. The exploitation system that will be applied
4. The organization of the breeding in the farm
5. Establishing forage rations by age
6. Calculation of animal feed and forage base surface
7. Provide fodder from own sources
8. Budget for income and expenses in the farm
9. Measures to ensure animal welfare
10. Veterinary measures to prevent and fight diseases in farm
11. Respecting the natural animal product traceability from the farm
12. Specific possibilities of accessing European and budget funds

Among the effort of the actual and potential investors in breeding and exploitation of buffaloes I recommend to take into consideration a few measures that should be taken now in equal part by the institutions authorized to manage the present and the perspective of the Romanian zootechnics, as tomorrow might be too late.

1. Support by all legal means to establishment, consolidation and development of private buffalo farms of dimensions that are capable to ensure productive performance, quality and profit
2. The current and potential buffalo breeders must be permanently preoccupied with finding the most efficient and pragmatic solutions reported to the actual conditions on the farm to harmonize growth and exploitation environment with productive capacity of animals, in accordance with European standards of animal welfare and respecting the Code of good practice in processing physical production of animal
3. Breeding and exploitation of buffaloes must take into account the sustainable development of agriculture and of the Romanian rural environment, process through which it meets the needs of the present without compromising the possibility of future generations to satisfy it’s needs from an economical, social and environmental point of view

4. The pastoral heritage of Bihor county (138.834 natural pastures and 44.668 ha natural meadows, 3,7% out of the pastoral heritage) can represent an endless natural resource of buffalo breeding in efficient and durable conditions
5. The free stabulation must represent the element of modernization of the exploitation of buffaloes, essential factor in productivity growth and in the economical efficiency in the exploitation

Generalization of the artificial insemination in the breeding activity of buffaloes, by exercising a strong selection pressure on the actual buffalo population with the purpose to homogenize the morphological, productive and reproduction parameters of the breed, in the same time with raising the herds from the official production control, until the minimum level of 30% from the womb herd

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