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## Case study on buffalo recording systems in Bulgaria

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The recording system in Bulgaria goes back to 1953, when the cooperation of agriculture and buffalo farms for 100 to 500 dairy buffalo cows were established. The main reasons for establishing a well organized scheme were the implementation of machine milking and the establishment of an animal selection centre in every district.

- The approximate overall input level of the production environment.  
Milk yield:  
1st lactation – 1 650-1 750 kg, 7.5 fat percentage, 4.5 protein percentage;  
2nd lactation – 1 800-2 000 kg;  
3rd lactation – 1 920-2 350 kg;  
body weight - 550-600 kg for adult female;  
body weight - 700-800 kg for bulls.
- The approximate number of herds involved as a percentage of the total number of herds:  
About 10 herds or 5-10 percent of the total number.
- The approximate number of recorded buffaloes:  
250-300 buffalo cows.
- Animal categories involved in the recording process (all offspring, male or female offspring only, parents, etc.):
  - All dairy buffalo cows in the herds of the Buffalo Research Institute, Shoumen; cooperative farms; private farms with more than 20 buffalo cows and those cows which were selected for bull-mothers in the villages.
  - All male and female young animals in the Buffalo Research Institute and cooperative farms.
  - In private farms with one to two buffaloes, those of male calves which are selected for young bulls.

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**Briefly  
characterise  
the buffalo  
recording  
system in your  
country**

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- Purposes of the system (on-farm management decisions, on-farm health decisions, on-farm breeding decisions, central breeding decisions, etc.).
  - on-farm management for nutrition according milk yield and daily gain for young animals;
  - to form the salary of the labourers;
  - on-farm breeding making breeding plans for the herd; for pedigree of the animals, for selection of female and male calves, offspring of bull-mothers;
  - central breeding decisions;
  - total number of recorded animals in the country;
  - average milk yield;
  - total number of culled buffalo cows and the reason for that;
  - total number of selected young bulls;
  - total number of the heifers for replacement;
  - total number of cows from AI;
  - adaptation of the list of bull-mothers.
  
- Type of animal identification employed.

All animals are identified at birth with an individual number on the right ear and their mother's number on the left one. There are also used tags with the same number on the right ear. A new registration system started last year according to the requirements of the European Union.
  
- Traits measured, frequency, etc.
  - milk yield, fat percentage, protein percentage - 4A;
  - body weight every month at the Buffalo Research Institute and cooperative farms;
  - body measurements every month for female animals and only the selected males.
  
- Other information collected (pedigree, feeding, health, etc.).
  - pedigree;
  - abortion;
  - premature born;
  - mortality;
  - twinning.
  
- Types of analyses of crude data.
  - on-farm
  - average milk yield;
  - number of dairy buffalo cows;
  - number of dry cows;
  - number of calvings;
  - date of insemination;
  - on the central location (see section on Purposes of the system).

- Is data computerised and stored and how?  
An information database was established at the Buffalo Research Institute Shoumen and information from all over the country was stored. It was used for the estimation of genetic and phenotypic parameters of selection traits; correlation between traits, estimation of BV of the bulls and bull-mothers.
- Describe Government and farmer involvement.  
About 60 percent of the total budget of the recording system is financed by the Government.
- Who pays the recording and has this changed over time and why?  
The cost of milk recording, AI and training are covered by the farmers. The prices change according to inflation.
- Are there buffaloes that are officially recognised as being of higher genetic merit?  
Yes.
- How many bulls? How many females? Are they evaluated every year? Or how often?  
40-50 bull-mothers, 2 600 kg milk yield for 1st lactation (more 3SD; SD=320 kg).  
About 80 000 deep frozen doses are kept in the station of AI from proven bulls with high genetic merit (BLUP).
- How is their genetic merit established?
  - on pedigree, up to grandparents, half-sibs, minimum 40-50 observations;
  - on pedigree, regression dam-daughters;
  - regression, daughter-herd mate;
  - contemporary comparison, BLUP, minimum ten daughters, selection index, including milk yield, fat percentage, protein and AFC.
- The most important moment for the genetic improvement of the buffalo population is making a breeding programme including parameters of selection traits; number of lactations; number of inseminations for one conception; percentage fertilisation; genetic standard deviation; proportion of selected buffalo cows; intensity of selection; generation interval; heritability of traits; number of dams for one young bull; size of the progeny group; etc.

Each breeding programme is worked out according to the conditions of the country. A team of researchers, programmers and mathematicians are needed for the development of the programme. The infrastructure

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**Do you have a genetic improvement programme for buffalo?**

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of the recording system is in second place of importance for the genetic improvement of the population. In countries where the size of the herds is comparatively big (from 20 to 150) the milk recording is easy to realise. It is however, very difficult in countries where 80 percent of the buffaloes are raised on small farms (1-2 buffalo cows). This requires a large number of staff and high transport costs. The size of the population under AI is in third place of importance at present.

- How is the genetic improvement distributed all over the country?
  - AI;
  - sale of animals, a couple of farmers buy a bull with their own money.