Management of Animal Production

Management of Production

Introduction

- At present, it is desirable, as in EU countries, to view animal production as a result of ecologically sound, economically viable and socially just production.
- Modern and prospective livestock sectors must be both environmentally friendly to humans and animals themselves, with a clearly defined attitude towards natural resources and their management.

Livestock production

- **Main Objective**: regularly ensure the necessary quantity and quality of products of animal origin with a high content of components of full-fledged nutrition of the population, with a strong view to increasing production efficiency and labor productivity.
- The **importance** of production processes in the livestock sectors **lies in particular**:
    - in the production of animal products and the nutritional function for the population,
    - provides raw materials for the processing industry,
    - contributes to the economic stabilization of primary production agri-entities,
    - main producer of organic fertilizers,
    - maintain a biologically equally balanced system of land management,
    - meet reproductive, breeding and commercial objectives.

Characteristics of Livestock production

1. *The **biological nature*** lies, as in the crop production, in the fact that the basic means of production is biological material - animals, which form one of the decisive parts of the results achieved.
2. *The **link to the crop production sectors is determined by the appropriate level of ensuring the feeding and nutrition*** **of livestock**. On the other hand, the livestock industries provide sufficient quantities of organic matter, which significantly affect soil fertility.
3. ***Continuity results from biological nature*** – i.e. the need for constant production. Production processes are carried out constantly and also without interruption, among other things, chicks must be born, which are further kept for the resulting product.

Characteristics of Livestock production

4. ***High concentration of factors of*** **production in a small area**. Livestock industries are not as blanket as crop production. Individual sectors can be placed on a small area where a high number of game can be concentrated. The determination of the optimal concentration of animals should be based on: marketing analyses, feed sources, in particular their own origin, traffic conditions, level of inputs and environmental impact.
5. ***Mass production*** is the result of higher concentrations of animals and the application of large-scale production technologies in the livestock sectors (e.g. milk, egg, meat production). At the same time, conditions are created for the application of a high degree of specialisation, the introduction of interchangeability, the achievement of high labour productivity and efficiency at lower unit costs.
6. ***The multi-production of animal*** **production processes makes it possible to obtain several by-products in addition to the main product**. For example, in dairy farming, in addition to milk production, calves and livestock manure are also obtained.

Characteristics of Livestock production processes

- ***Livestock are decisive factors (factors), acting as a means of long-term tangible assets and as input elements***. If farm animals provide the resulting product or activity and humans generally act on input elements (e.g. feed) in their unchanged form, then livestock, *unless they change their form*, act as assets.
- A person, by his activity (feeding, watering, cleaning, etc.), **acts as an input with assets**, livestock is transformed into a desirable product.
- ***The limited impact of*** **natural conditions on animals occurs by rational housing in the appropriate objects**. Some mediated impact on animals is caused by feed of plant origin, its quantity and quality.
- *The cyclicality and rhythm of production processes* depends on production technology. The production of individual products is repeated regularly and rhythmically. Cyclicality consists of:
    - work cycles that are short-lived and repeated by man two or more times a day,
    - technological cycles that are long-term and depend on the category of animals and the technology.

Cattle production farming

Basic concepts

Basic concepts of production management in cattle farming sectors

- Cattle farming is a **crucial** and the **main sector** of animal production and of the entire agricultural system.
- The importance of cattle breeding is similar to that of the livestock.
- Production processes are arranged in series and in combination in cattle breeding industries.

The basic concepts of cattle production include

- Reproduction of the herd is a continuous process of renewal of the livestock herd according to established criteria. Basically, it is about restoring the production process. By scope, a distinction can be made between:
  - **Simple reproduction** in which the production process is restored to an unchanged extent;
  - **Extended reproduction**, the production process is restored to a greater extent than the previous process;
  - **Reduced reproduction**, the production process is restored to a reduced extent than the previous process.
- The basic prerequisites for rational reproduction are:
  - **Efficient use** of the basic herd;
  - Increasing the **number of animals** from the mother per year;
  - The **involvement of computer technology** in the organization of herd reproduction;
  - **Rigorous recordkeeping** of animals in each housing building, etc.

Turnover of a herd

The turnover of a herd

- The turnover of a herd (flock): represents the weight and piece balance of increments and losses of animals in each category over a certain period of time (month, quarter, year).
- The expression of the turnover of the herd shall be based on the relationship:

KS = PS + Pr - U

KS = final status of the animals of the category concerned as at the last day of the month, quarter or year (in pcs, kg, t),
PS = initial animal status on the first day of the reference period (in pcs, kg, t),
Pr = total increments of animals in pieces or weight during the reference period,
U = total animal losses in the reference period in pieces or weight.

The turnover of the herd may refer to:

- **Closed:** which allows reproduction of the species of livestock concerned in its own production and organizational unit. All reproductive categories of animals of one species should be available in this unit. The exception is CATTLE fattening, which, although lacking in CATTLE breeding, is still a closed herd turnover,
- **Open turnover of the herd**: not represented by all reproductive categories within one species of animals in its own production - organizational and business unit. Intercompany purchases (movements) of animals are necessary to ensure reproduction of the species concerned.

Structure of a herd

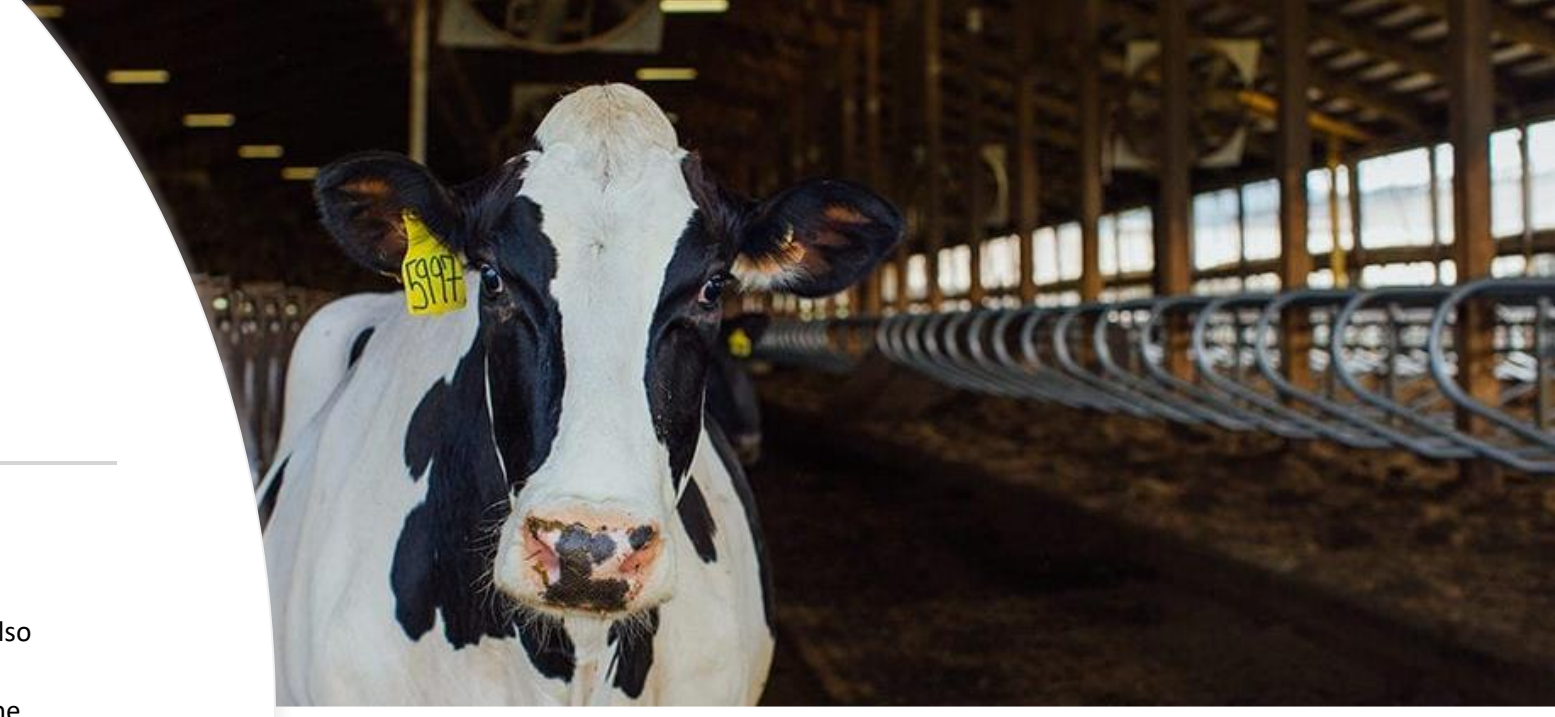
- **The structure of a herd**: representation of individual categories or groups of animals expressed according to certain criteria (sex, age, reproductive phase, etc.) of the total animal status of the category or species within the business unit or other territorial unit.
- **Not stable**: constant changes in the numerous states of individual categories of livestock.
- The most important group of animals in dealing with the structure of the herd is the reproductive part of the herd, especially the breeds, which must be constantly replenished.
- When determining the structure of the herd, first:
    - Determine the necessary number of animals of the key category - the reproductive part of the herd (herds of breeds),
    - The number of animals needed for immediate replacement of animals in the key category shall be determined,
    - The necessary number of animals in other categories shall be determined.

Livestock breeding

Milk production

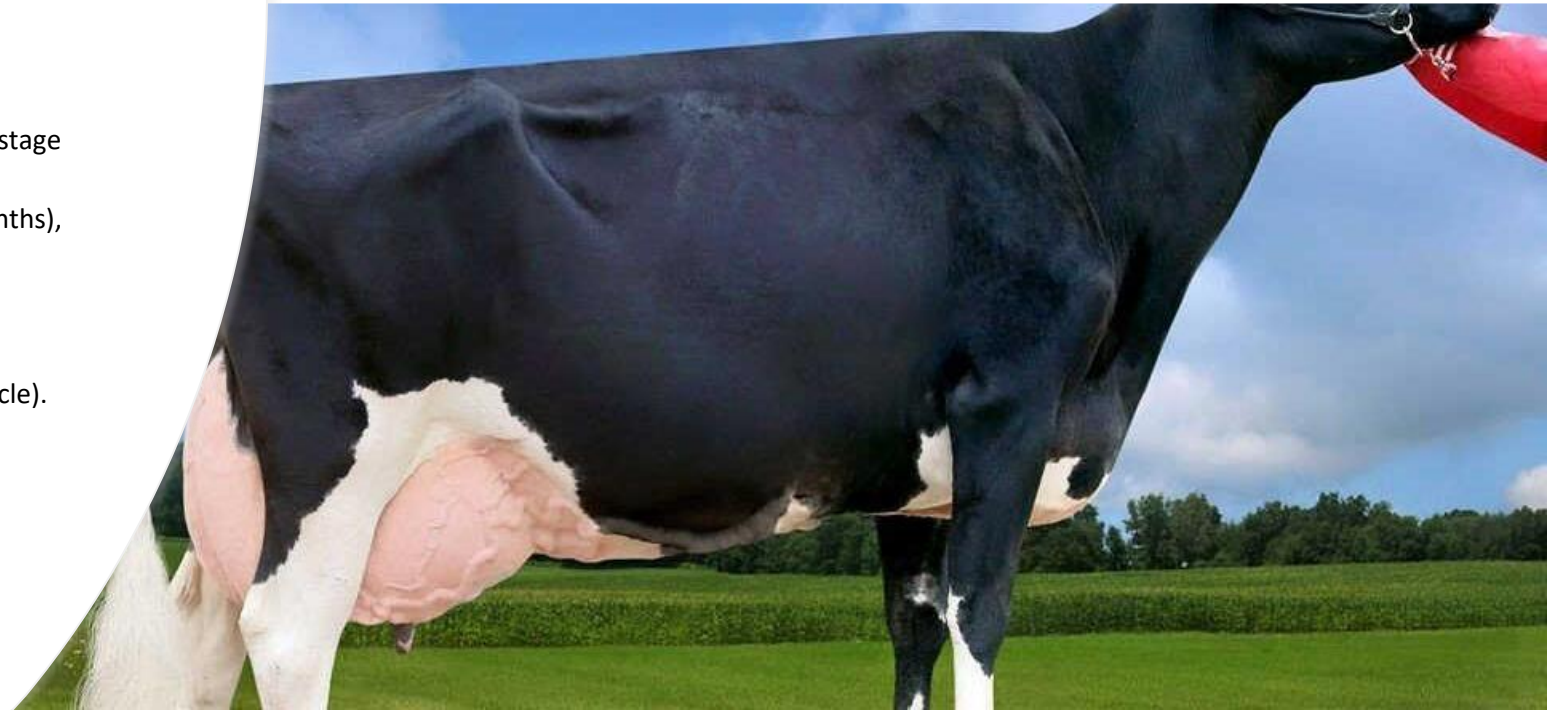
- The most important tasks of milk production management include smooth and balanced milk production as well as calves for both production and reproductive objectives.
- The production of organic fertilizers is also of great importance for the needs of the crop production sectors.
- The importance of milk production has been detailed in disciplines.
- Milk is irreplaceable food ingredient for the following importance:
    - therapeutic effects, especially for children and the elderly,
    - rich in vitamin content,
    - favorable composition of minerals and other substances.
- The intake of 1 liter of semi-skimmed milk represents energy of 1900-2065 kJ and in addition the composition in the ratio of fat: protein: sugars = 37:25:38, which is ideal for human nutrition.

Livestock breeding



Dairy cows

- From a production-organizational point of view, dairy cows undergo different stages of the reproductive cycle in milk production, which also results in different demands on treatment, nutrition and housing.
- Therefore, it is cows can be classified in groups with approximately the same requirements, mainly for nutrition and care.
- After all, one feeding day of the dairy cow in the current conditions is approximately EUR 6-8. FD^{-1}. (FD- feeding day)
- In large-scale production conditions, the breakdown of dairy cows by stage of the reproductive cycle appears to be the most optimal to:
    - dairy cows (group) during the dry period (lasts up to 2 months),
    - dairy cows (group) in the labor period (max. 1 months.),
    - dairy cows (group) in the period of starting milking and insemination (max. 2 - 3 months.),
    - dairy cows (group) in the production period (rest of the cycle).



Livestock breeding

The number of dairy cows

• *The number of dairy cows or the numerous sizes of the dairy cow group 'Nx' may be* expressed, inter alia, according to the length of the dairy cow's stay in the group as follows:

$$Nx = \frac{D}{365}.Nc$$

• Where: Nc = is the total number of dairy cows on the holding, D = number of days of stay of dairy cows in the relevant group.

• **Selected indicators of milk production organisation and economy**

- number of calves born in ks. $^{100\text{-}1}$ cows.
- number of calves produced in ks. 100^{-1} cows
- average annual milking in 1 dairy cow^{-1}
- own costs in EUR. $^{l\text{-}1\ milk,}$
- total cows' milk production in 100 litres
- labour productivity in EUR.worker $^{-1}$
- rate of return in %,
- labour in milk production (min.$l^{-1),}$
- suckling of dairy cows in %,
- loss of calves mortality in %,
- consumption of nuclear feed in kg. $^{l\text{-}1\ milk,}$
- the economic result from implementation in EUR.l^{-1} (milk).

Cattle fattening

Management of cattle beef production

- The **aim:** to provide quality and dietary meat.
- It transforms rich sources of own volume feed into a desirable product, provides raw materials for the processing industry and at the same time provides organic fertilizers for plant production.
- **Fattening time** is of considerable importance for achieving more efficient production. The aim is to achieve the shortest possible time from the put-away of animals (approximately 180 kg rye) until removal (approximately 500 - 530 kg weight alive).

Dependence of cattle fattening time on average daily increments

Average daily gain in kg.pcs^{-1}	Fattening time in days
0,6	583
0,7	500
0,8	437
0,9	388
10	350

Source: Paska 2009

Livestock breeding

Groups of animals in cattle fattening

- From a production-organizational aspect, it is important to create groups of animals with approximately the same flag characteristics.
- Weight differences should be in the range of 20-40 kg, while the ratio of feed places to the number of animals in pens should be in a ratio of 1:1.
    - Intensive fattening of cattle nuclear feed, can be carried out even without dependence on the soil fund from 150 kg to 500 kg live weight and daily increase of 1000-1350 g. Minimum consumption of bulk feed is also needed,
    - Intensive fattening cattle based mainly on bulk feed, (mostly applied in our conditions and seems to be the most economically appropriate). Fattening begins at 5-6 months after birth and should end at 15-16 months, when bulls reach a weight of 500-550 kg.
    - Fattening of cattle is carried out in an extensive form up to 300 kg of live weight, which can be followed by an intensive form of fattening up to 520-550 kg of weight. (disadvantage of this form is a risk of infection of diseases).
    - Extensive cattle fattening and weights of 550-650 kg, carried out using basic bulk feed, grazing, silage, etc. Daily increments reach 500-700 g.
    - Pasture fattening of bulls (voles)is suitable for potato, foothill and mountain production conditions. This type of fattening is carried out up to the age of 24 months and the weight of 500-550 kg. In doing so, grazing and bulk feed are combined.

Livestock breeding

Pig farming

Production management in the pig farming

- The pig farming sectors provide meat production that plays an important role in ensuring the nutrition of our population, despite the fact that the number of piglets bred in our country has been steadily decreasing recently.

The basic specificities of the pig farming sectors

- High fertility and rapid development of animals,
- Higher slaughter yield (on average 77-83 %) than cattle (42-65 %),
- More perfect use of nutrients in feed (per 1 kg weight alive, consumes 4-6 feed units, while cattle up to 7-10 feed units),
- High investment costs of housing as for cattle are not required,
- Technologies in pig farming allow for high concentrations of animals with computerized management of production processes, in particular in fattening,
- The networkless operation and higher consumption of nuclear feed make it possible to exclude pig farming sectors from the normal production structure of primary production agri-entities.

Livestock breeding

Production process

- Within the pig farming sector, individual production processes are carried out in the **holding of sows**
- In the production of pig meat for fattening of pigs, in piglets and in the breeding of gilts.
- In addition to the above production processes, breeding and breeding processes take place in breeding and breeding holdings, with the aim of providing biological services for primary production.

Livestock breeding

Phases of production-sows. Sows go through **3 basic development phases** during the **reproductive cycle**, according to which groups of sows are subsequently formed, mainly in specialized primary production plants. Basically, these are the following groups:

- ***group of unadmitted, admitted and pregnant sow****s* **until the 21st day of pregnancy**. The length of stay in this group is 35-42 days. Housing is individual or group, while the number in the group should not exceed 5-7 pieces. Basic attention should be paid to the implementation of timely quality biological interventions in animals.
- ***group of pregnant sows from day 21 to 105*** **of pregnancy**. The number of stays in this group is 83-90 days. Housing sows can be individual, or in pens.
- *a*. As a rule, the given period ***group of highly pregnant, native and lactating*** **sows**begins 7-10 days before farrowing, with sows remaining here for 3-4 weeks. Housing is fundamentally individual in pens. In doing so, the requirements for tour operations are respected, under which it is necessary to understand the one-time flag and the removal of the entire birthing or compartment.

Livestock breeding

- **Management of pigmeat**
- The aim of the management of pigmeat production in pig farming is the regular production of fattening pigs for the fulfilment of market requirements in the field of quality pigmeat.
- The pig fattening touring plant is a one-off removal of a group or several groups of animals from an object and a one-time occupancy of free pens by emerging fattening pigs within the housing.
- In between, it is necessary to carry out a thorough disinfection of the premises.
- The touring method has considerable advantages in the nutrition and feeding of animals, treatment I in the cleaning of housing objects compared to the continuous mode of operation.

Livestock breeding

- **4 forms of pig fattening**
- ***traditional fattening****:* one of the most demanding ways of fattening pigs. This method has been applied mainly in the private conditions of workers of primary production agri-entities, which persists until now. The standard of operation reached a maximum of 200 people. Time consumption was 2.24 - 2.95 $min.pcs^{-1}.day^{-1}$. A certain limiting factor was the use of a not powerful technique.
- ***wet fattening:*** *fattening of pigs with moist (wet) mixtures.* It belongs to modern industrial ways of fattening pigs. He's unpretentious to do a living job. The standard of operation reaches 700- 1200 $people^{-1}$. Time consumption is 0.44 - 0.75 $min.s^{-1}.day^{-1}$. This method of fattening prioritizes biological considerations over economic considerations.
- ***dry fattening:*** *fattening of pigs with dry mixtures, more* than half of the fattening systems of pigs in Slovakia. Similarly, in Western European countries, this system has considerable application. The standard of operation reaches 1800 -2000 $people^{-1}$. The time consumption is 0.26 $min.pcs^{-1}.day^{-1}$. Peak labor productivity is achieved.
- ***combined fattening***: produced by the application of elements from previous methods of fattening pigs. This system also has its application in different countries around the world.