

## STUDY ON THE INTERRELATION BETWEEN ANIMAL WELFARE AND PRODUCTION IN DAIRY CATTLE

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### Abstract

The submitted report has not proposed a description of the welfare of cattle, but is mainly aimed at highlighting the fact that the animal is not an "object" that man can exploit at will, without being interested in providing an optimal environment. Animals are living souls who have needs, needs which if understood and if a good relationship between man and animal is kept, one can speak of maximum yields and even record. The first definition of animal welfare was proposed by the Universal Declaration on Animal Welfare and supported by the World Society for the Protection of Animals (based in Boston, USA). This first statement presented, in the first part, animal welfare as "the degree to which the requirements for physical, behavioral and psychological needs of the animal are satisfied." In the second part of the definition, a negative concept is presented, for animals that are dependent on humans, known as the five freedoms simultaneously: 1- ensuring access to fresh water and food; 2- ensure appropriate environment, including watering and comfort; 3- prevention of pain, injury, rapid diagnosis and treatment of wounds; 4- elimination of fear and mental suffering; 5- providing space, facilities and the company of other animals to express normal behavior. The concept of animal welfare must be made common knowledge to all the employees in the farm. The idea that animal welfare depends on their behavior and their behavior towards animals may induce or prevent fear response and undesirable emotional state should be transmitted and understood.

**Key words:** cattle, concept, definition, animal welfare.

### INTRODUCTION

We talk and give attention to the dairy cattles because they are one of the most important farm animal species by being the source that provides a wide range of consumer products like milk and meat mainly, from which derives a lot of preparations, and also a sum of subproducts useful to man, such as the skin and manure. From Figure 1, show that 95% of the world total production of milk, 38% of world production of meat, 75% of the total production of manure and 90% of the raw skins (Velea and Mărginean, 2012).

Milk is the most important aliment obtained from this category of animals, both by its chemical composition and biological value expressed mainly by its the degree of digestibility.

It is well know that the milk contains more than 100 substances that are necessary for human body, including the 10 essential amino acids, 45 minerals, 25 vitamins and last but not least, 10 fatty acids.

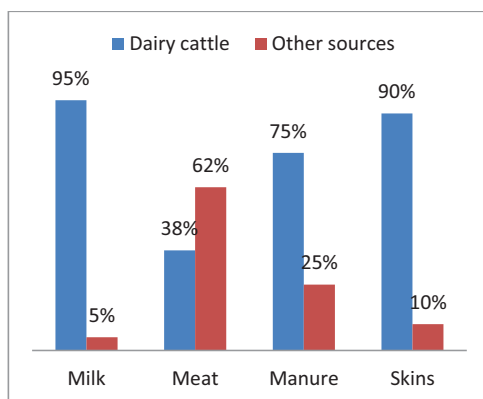


Figure 1. The proportion of products obtained from cattle in world production

Through their physiological functions, dairy cows transform the substances from forages into milk (50%) and meat (20%) with a very high efficiency (Figure 2).

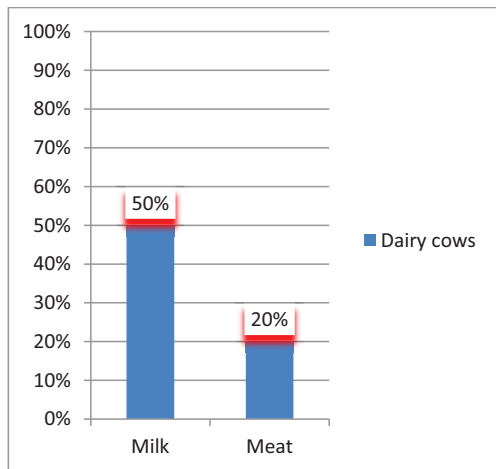


Figure 2. Feed utilisation in dairy cows

Cattle welfare is a very valuable and used concept of the contemporary world.

The importance of this concept was recognized by the United Nations, which already ranks it in the circle of interests of the Eurogroup for Animal Welfare, the Council of Europe, European Union, World Health Organization, and the list goes on.

The importance of the concept of animal welfare was formalized for the first time, by the 33rd protocol of the Treaty of Amsterdam, of the European Union in 1997.

In this treaty was presented the idea based on which, animals are living beings who have senses and intrinsic value.

Besides the zootechnical value of the animals, dairy farmers have to understand that cows need the providing of specific comfort in order to achieve their genetic potential (Battini et al., 2009).

We can not speak of productive performances in dairy cows as long as they received deficient feed rations in terms of energy or other nutrients and were maintained on permanent litter for the last 3 years.

In time, the idea that productive performances are directly related to animal welfare, was better understood, and the interest of more organizations to study, make known and to

regulate this concept has grown, so have formed new dairy farming systems, systems that creates a bridge between ethics, engineering and medical sciences.

With our country's integration into the European Union, there were legislative changes of the legal acts of this field, that were emitted by the Council of Europe. These changes are aiming at improving the animal welfare at the dairy farm level, by implementing new assessment methods and a series of specific protocols, largely based on socio-economic reasons.

## MATERIALS AND METHODS

The working method consisted in consulting the scientific results obtained at national and international level, until now, in the dairy cows welfare field.

## RESULTS AND DISCUSSIONS

We can not have expectations regarding production performances if we do not take animal welfare action on how to feed and maintenance the dairy cows.

Because the animal welfare depends on the housing conditions of the animals and the Management in the farm, experts of the European Food Safety Authority (EFSA), were involved in supporting the welfare of cattle, by implementing of new legislative basis for systematic risk assessment at the dairy farm level. The European Union was, as well, involved by financing the project titled "The Welfare Quality", within which were established a set of measures to assess animal welfare and at the same time were established strategies to achieve all 12 important criteria, that are part of several areas of animal welfare (Table 1). Afterwards they were systematized in four main criteria, criteria that facilitated communication between consumers, these principles are found in Figure 3. The systematization of the 12 principles in only 4 basic criteria and good information about the impact of animal welfare in farms, in the sense that it is closely related with the quality of products obtained, conclusions that were reached from studies performed before, led to a growing interest in this concept among society, farmers and researchers.

Table 1. Principles and Criteria of animal welfare (Keeling and Veissier, 2005)

The principle		Animal welfare criteria	Examples of potential measurements
Good feeding	1	The absence of prolonged hunger	Body condition assessment
	2	The absence of prolonged thirst	Access to Water
Good housing	3	Rest confort	Frequency of different positions of rest, lift and seating behavior
	4	Thermal confort	Panting, shaking
	5	The easy movement of the cows	The slipping and falling
Good health	6	The absence of wounds	The clinical state of skin, the carcass quality, pododermatitis
	7	The absence of diseases	Enteric problems, disqualification at slaughter
	8	The absence of induced pain cused by the management methods	The evidence of routine mutilation such as cutting the tail or the horns, efficient stunning at slaughter
Proper behavior	9	The expression of social behavior	Licking, aggression
	10	The expression of other types of behavior	Playing, abnormal behavior
	11	Good human – animal relationship	Nearby and / or avoidance tests
	12	The absence of general fear	Test with new objects

Later, because of the increasing interest among the society, research institutions, educational organizations, enterprises, government agencies and other development institutions were involved in developing and implementing the concept of animal welfare, providing expert support to the dairy farmers.

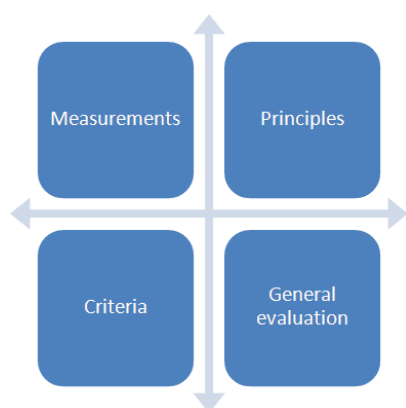


Figure 3. The evaluation is based on estimating the welfare by measurements at the level of the animal that reflect the quality of the housing and the management at which the animal was exposed. (Blokhuys et al., 2009)

In 2001, Fregonesi and Leaver studied as animal welfare indicators the behavior and health of dairy cows housed on permanent litter compared to the behavior and health of dairy cows that are housed in individual berths. The two researchers watched the comparative indicators of animal welfare within the two systems of housing and concluded that dairy cows that were maintained on permanent litter, have spent a longer period of resting and rumination than cows maintained in individual berths.

Regarding individual berths housing system, the cows were much cleaner, but studies have shown an equality between both systems in terms of milk production, somatic cell number or the motion score that were observed at evaluation.

Productive performances are closely related to the stables where cows are housed.

Regarding the dairy cows, we should be concerned mainly about the udder and the very close relation between the udder health and the next two aspects: condition of the environment in which the animal lives and cow's corporal hygiene. Both aspects are the responsibility of the dairy farmer, in the sense that he must

provide to the animal an optimal environment of housing by providing quality litter, microclimate, the optimal number of heads in

the animal house and a suitable system of accommodation. Natural luminosity in the animal house must be ensured by windows with vertical opening.

Table 2. Minimum values for the natural lighting index (ANSVSA, 2005)

Building density	Lighting index	Lux
Milking cows	1"20	40-60
Maternity	1"15	60-80
Young breeding cattle	1"16	40-60
Young fattening cattle Phase 1	1"10	40-60
Young fattening cattle Phase 2	1"15	40-60
Fattening cattle	1"25	25-30

The microclimate in the animal houses is, also, a very important factor, and the dairy farmer must take into account of it, if he wants to achieve the proposed productive performances.

In Table 3 are presented the standards of temperature, humidity and air currents to ensure an optimum microclimate.

Table 3. Ensuring microclimate in dairy houses (ANSVSA)

Category of the cattle	Temperature (°C)			Humidity (%)		The air currents speed (m/s)	
	Minimum	Maximum	Optimal for calves	Minimum	Maximum	For min. T°	For max. T°
Milking cows	6	24	10"14	60	75	0,2"0,3	1
Maternity	12	24	20	55	70	0,1"0,2	0,1"0,2
Young cattle	6	24	8"10	60	75	0,2"0,3	1

Using the data in the table 4, we can accurately calculate the optimal surface which the animal needs to feel comfortable, so as to avoid stress due to overcrowding.

Another factor that is determinant for cows welfare is proper feeding (table 5) and watering. Gjodesen et al. (2010) have stated that the need for water and feed are interdependent. It is true that, when the cows

are feeded with forages with a higher water content, the volume of water consumed will be diminished. Feed have a strong impact on health and wellbeing of the cows, and for this reason, the dairy farmers, should give a special attention to it.

Table 4. Distribution of the floor space (ANSVSA)

Body weight (kg)	Minimum rest area (m2)	Minimum area without litter (m2)	The total minimum area / animal (m2)
≤100	1.5	1.8	3.3
101 - 199	2.5	2.5	5.0
200 - 299	3.5	2.5	6.0
300 - 399	4.5	2.5	7.0
400 - 499	5.5	2.5	8.0
500 – 599	6.0	2.5	8.5
600 – 699	6.5	2.5	9.0
700 - 799	7.0	3.0	10.0
≥800	8.0	3.0	11.0

Table 5. Nutritional requirements for maintenance of dairy cows (Stoica, 2001)

Body weight (kg)	Dry Matter (maximum kg/zi)	UNL (/zi)	PDI (g/zi)	Ca (g/zi)	P (g/zi)
450	10,36	4,64	225	18	18
500	11,26	5,08	243	20	20
550	12,12	5,46	262	22	22
600	12,96	5,82	279	24	24
650	13,77	6,18	296	26	26

Studies to date have shown that the welfare of dairy cows, is influenced by several factors, among which we mention the proper maintenance of the hooves. If this action is not executed properly, it can cause sub-clinical laminitis, disease that is detectable only when the bleeding is taking place, situation that seriously affects the productiv performances of the dairy cows.

Hard surfaces, also, favors the appearance of limbs disorders, that is manifesting with an incidence of 80% in the hind legs, on the outer surface of the hooves.

DLG Research Institute, showed, in the study on the influence of the surface type of the rest zone, over the limbs disease occurrence, that the surfaces with a softer texture can provide an optimal level of comfort and can significantly reduce the incidence of this kind of affections at the herd level.

## CONCLUSIONS

We have to realize that the concept of dairy cows welfare should not remain at a theoretical level, and must be implemented in every farm, through dairy breeders and especially dairy farm workers.

Cattle are animals whose exploitation is profitable if the their well-being is ensured, but, having no reason, they can not choose how to exploit themselves, so, the breeders, must intervene to ensure the optimal living environment and finally a normal relationship with them.

Dairy farmers must understand that once they provide the optimum environment to the cows, they can expect at productive performances, otherwise the results are: deficiency, failure and, finally, lose of the income.

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