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BEHAVIORAL CHARACTERISTICS OF FIRST-CALVING SCHWYZ CATTLE COWS BELONGING TO DIFFERENT BREEDING SELECTIONS

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ABSTRACT

Cow ethology reflects the relationship between behavior and productivity. The study examined feeding, resting, and rumination indicators in first-calf cows of different selections. Cows of American selection showed higher activity and efficiency. The results confirm that considering ethological traits contributes to increased milk productivity and should be applied in livestock farming practices.

INTRODUCTION

Cattle ethology, which studies the behavioral patterns, environmental adaptation, and responses of animals to external stimuli, plays an important role in increasing milk productivity in dairy cattle. In modern livestock farming, improving only feeding practices and breed quality is not sufficient; taking into account the physiological condition and natural behavior of animals also provides significant productive benefits.

In conclusion, comprehensive study of cattle ethology and its practical application is considered one of the effective approaches for improving milk productivity. Favorable housing conditions, proper grouping, balanced nutrition, and calm handling positively influence the physiological state of cows, reduce stress, and ensure higher productive performance.

Breeding and selection programs conducted in livestock farms are primarily aimed at creating highly productive herds. In improving the productive qualities of cows, behavioral reactions during their growth and development stages are of practical importance, which, in turn, are closely associated with environmental factors [2; 9; 5; 3].

Taking into account the amount of time cows spend on ethological activities throughout the day provides opportunities to improve cattle productivity in farms operating under industrial milk production technologies,

as well as to predict the heritability of these traits [8;6;7].

Cows are naturally calm and social animals that tend to live in groups. A hierarchical order exists within the herd, and each cow occupies its own position in the social structure. When this natural order is disturbed, for instance, when a new cow is introduced into the herd or when space is limited, stress conditions may occur. Stress leads to hormonal changes that reduce milk production. Therefore, proper grouping of cows and providing sufficient space for them are essential management practices in dairy farming.

Aim of the Study. The aim of the study was to investigate the behavioral characteristics of first-calving Schwyz cows belonging to different breeding selections and to draw relevant scientific conclusions.

RESEARCH MATERIALS AND METHODS

The study was carried out at the "Turg'unboy Shokirov" breeding farm located in Asaka district of Andijan Region. The research involved first-calving Schwyz cows belonging to different selection origins. Three experimental groups were formed for the study. Each group consisted of five first-calving Schwyz cows. Group I served as the control group and included cows of Austrian selection; Group II consisted of cows of German selection, whereas Group III included cows of American selection.

When assigning cows to the experimental groups, their origin, calving period, physiological condition, and live body weight were taken into consideration. Milk productivity was evaluated by monthly control milking, while the physicochemical properties of milk were determined using the Laktan 1-4 Milk Analyzer.

The ethological characteristics of the cows were assessed using the chronometric method developed by V.I. Velikzhanin, which allowed determination of the duration of the main behavioral activities [1]. Milk fat yield was calculated according to generally accepted methods.

The feeding activity index (FAI) and locomotor activity index (LAI) were determined using the following formulas:

FAI = (feeding time + rumination time) / 1440 × 100

LAI = (standing time + rumination time in lying position) / 1440 × 100

The obtained numerical data were statistically processed in accordance with generally accepted biometric methods [4].

RESULTS AND DISCUSSION

The interaction between humans and cattle is considered an important factor in dairy farming. When stockpersons treat cows with care and positive handling, the animals exhibit lower levels of fear and become easier to manage. Scientific studies have shown that cows with a higher tendency toward positive human interaction tend to produce more milk. The study of behavioral activities in cattle plays a significant role in improving livestock production efficiency. Behavioral indicators such as standing, lying, feeding, and rumination reflect the physiological state of the animal's body. Therefore, analyzing the effects of different management technologies and

husbandry conditions on these parameters is a relevant and important research issue in modern animal science and dairy production systems.

Taking into account the above-mentioned considerations, in our experiments we aimed to study and analyze the behavioral indicators of first-calving Schwyz cows belonging to different breeding selections. The data obtained from the observational results are presented in the table below.

Table 1

Ethological characteristics of first-calving Schwyz cows of different breeding selections, n=5, (X±Sx)

Behavioral traits	I (Austria)		II (Germany)		III (USA)	
	min	%	min	%	min	%
Standing, total	910,0±10,1	63,2	930,0±9,9	64,6	939,5±12,0**	65,2
Lying, total	530,0±10,4	36,8	510, 0±9,5	35,4	500,5±11,0	34,8
Feeding, total	763,3±19,5	53,0	777,8±18,9	54,9	789,8±20,0	55,5
Feed intake	370,0±7,9	25,7	378,0±7,7**	26,2	386,1±8,1	26,8
Drinking	19,0±1,3	1,3	19,9±1,5	1,4	20,4±1,1	1,4
Rumination in standing position	141,0±7,0	9,8	137,2±6,9*	9,5	136,0±7,2	9,4
Rumination in lying position	233,3±8,3	16,2	242,7±8,2	16,8	247,0±8,5	17,1
Total rumination	374,3±9,5	26,0	379,9±9,7	26,4	383,0±8,8	26,6
Locomotor Activity Index (LAI)	79,4±1,0		81,4±1,1		82,4±1,3	
Feeding Activity Index (FAI)	79,0±0,8		80,4±1,2		81,4±1,5	

*P> 0.95 ; **P>0.99

The feeding behavior of cows is closely associated with their ethological characteristics. Cows prefer to feed several times a day, and when they have free access to feed, they tend to consume more nutrients, which in turn leads to higher milk production. In contrast, if feeding times are poorly organized or if competition for feed is high, some cows consume less feed, which negatively affects their productivity.

The data presented in Table 1 show that there are differences in the total daily time allocated to feeding behavior among Group I (Austrian selection), Group II (German selection), and Group III (American selection). In particular, the total feeding time increased from 763.3 to 789.8 minutes across the groups.

Similarly, differences were observed in feed intake duration, which ranged from 370.0 to 386.1 minutes among the groups. In contrast, drinking time showed almost no significant variation between groups, with only minimal intergroup variation (~1.3–1.4%). Overall, cows in Group III demonstrated higher feeding efficiency, allowing them to be characterized as having a more active behavioral type in terms of ethological activity.

Lying and resting behavior is also of great importance for dairy cows. On

average, cows rest for 10–14 hours per day. During this period, the organism recovers, energy reserves are replenished, and digestive processes continue efficiently. Inactive lying is particularly important for improving blood circulation and increasing blood flow to the mammary glands, which in turn enhances milk production. If cows do not have comfortable resting conditions—for example, if the flooring is hard or unclean—they tend to rest less. This negatively affects blood circulation and digestive processes, ultimately leading to a reduction in milk yield. A comfortable and clean resting environment helps cows remain calm and relaxed. Lying behavior represents an important component of natural ethological activity in cows, reflecting their health status and productivity potential. In this state, the animal lies down with its body in contact with the ground and remains almost motionless. Often, rumination occurs during this period, although cows may also rest in a fully calm state without rumination. When the animal feels safe and comfortable, it lies down calmly and rests motionlessly for a long period. In contrast, noise, stress, limited space, or uncomfortable housing conditions disturb the cow, causing it to lie down less frequently or to stand up repeatedly. Such conditions may lead to fatigue, reduced immunity, and decreased productivity.

Assessment of lying behavior enables farmers to detect a wide range of problems at an early stage. For example, if a cow lies down less than usual, this may be associated with hard, dirty, or wet bedding conditions. In addition, hoof disorders or pain can also reduce the duration of lying behavior. On the other hand, excessively prolonged and inactive lying may, in some cases, indicate signs of disease, such as general weakness or metabolic disorders, and similar conditions.

Providing a comfortable resting environment is a key requirement for supporting normal behavioral expression. Soft bedding, dry and clean conditions, and sufficient space allow cows to lie down freely and comfortably. At the same time, ensuring adequate space per animal is important to reduce aggressive interactions within the group and to minimize social stress among cows.

In the experiment, analysis of standing and lying behavioral patterns of the cows showed a gradual increase in standing duration across all three groups. Specifically, standing time accounted for 910 minutes in Group I, 930 minutes in Group II, and 939.5 minutes in Group III. Accordingly, the proportion of time spent standing increased from 63.2% to 65.2% among the groups. In contrast, lying time decreased across the groups despite adequate housing conditions. In Group III cows, the duration of lying behavior was 500.5 minutes, which was 29.5 minutes (5.6%) higher than in Group I, but 9.5 minutes (1.9%) lower than in Group II. This shift indicates that Group III cows allocated more time to feeding activity. Such results suggest a higher level of behavioral activity in Group III cows, which may positively influence milk productivity.

Rumination is a key ethological trait characteristic of cattle and other

ruminant animals. During this process, the animal first rapidly swallows the feed, then regurgitates it back into the mouth, chews it again, and swallows it once more. Under normal conditions, a cow performs approximately 60–70 chewing cycles per cud bolus. This behavioral pattern is not only a part of the digestive process but is also closely associated with the animal's overall health status and productivity. Under natural conditions, cows ruminate several times throughout the day. Typically, after feeding, they engage in rumination while resting either in a lying or standing position. This process is essential because coarse plant fibers can only be effectively broken down through re-chewing, making them suitable for digestion. A reduction or cessation of rumination may indicate potential health problems in the animal. Rumination behavior is also closely linked to the nervous system of cattle. When a cow feels calm and safe, rumination activity increases. In contrast, under stress conditions such as loud noise, limited space, or social conflicts within the herd, this process decreases. Such conditions negatively affect the digestive system and ultimately lead to a reduction in milk production. Rumination time is an important indicator for assessing the physiological state of cows. For example, healthy cows typically ruminate for an average of 6–8 hours per day. A reduction in this duration may indicate poor feed quality, an imbalanced diet, or underlying health disorders. During rumination, a large amount of saliva is secreted in the oral cavity. Saliva helps maintain optimal rumen acidity and supports microbial activity, thereby improving nutrient digestion and absorption. Monitoring this process allows farmers and specialists to assess the condition of animals and take appropriate management measures in a timely manner.

In our experiments, observation of rumination behavior showed a slight increase in total rumination time among the groups. Specifically, total rumination duration was 374.3 minutes in Group I, 379.9 minutes in Group II, and 383.0 minutes in Group III. Compared with Group I, cows in Group II and Group III demonstrated higher values by 5.6 and 8.7 minutes, respectively. Rumination in the standing position was higher in Group I cows, which spent 3.8 and 5.0 minutes more time in this activity compared to Groups II and III, respectively. In contrast, rumination in the lying position showed the opposite trend. Cows in Group III spent more time in this behavior, exceeding Groups I and II by 13.7 and 4.3 minutes, respectively.

The higher values of the Locomotor Activity Index (82.4) and Feeding Activity Index (81.4) in Group III indicate that animals in this group exhibited a more active physiological state and more intensive metabolic processes.

CONCLUSION

The results of the study indicate that there are notable differences in behavioral patterns of animals raised under different country-based breeding conditions. In particular, cows of Group III (American selection) showed a higher standing time of 939.5 minutes (65.2%), which was higher compared to Group I. Correspondingly, lying time decreased to 34.8%.

Feeding activity indicators were also higher in Group III, with a total feeding time reaching 789.8 minutes. Feed intake and water consumption showed a stable increasing trend across the groups. At the same time, rumination processes, especially in the lying position, were recorded at a higher level in Group III.

A positive correlation was observed between productivity traits and behavioral characteristics in Schwyz cows of American selection. This provides opportunities for their effective utilization under farm conditions and for assessing their production potential. The obtained correlation values also allow their use in predicting milk productivity and in selection and breeding programs.

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