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ASSESSMENT OF THE RELATIONSHIP BETWEEN THE TYPES OF TEMPERAMENT OF BULLS AND THEIR MEAT QUALITIES

*Akkair B. 2nd doctoral student
S.Seifullin Kazakh Agrotechnical University, Astana*

The study of temperament can be considered the study of both stress and animal behavior, and, in fact, temperament can be considered as a trait that represents an animal's response to stress. Extreme or reactive reactions can damage the welfare of cattle and the safety of people. There is evidence that cattle with a calmer temperament have improved productivity (meat quality, carcass quality, milk yield, etc.); However, the influence of temperament on economically important traits may be different, and the biological basis of this effect is insufficiently studied [1].

There are several studies examining the relationship of temperament with the qualitative characteristics of carcasses and cattle meat [2].

It is known that the assessment of productivity allows you to identify cattle with high meat quality and improve the breeding value of these animals [3].

In the livestock industry, producers are constantly looking for ways to improve animal productivity (growth, health, meat qualities, etc.). To this end, temperament research has intensified as the relationship between temperament and animal productivity, including with the qualitative characteristics of meat, has strengthened. Thus, the influence of temperament is comprehensive, affecting not only the performance of the animal, but also its reaction to the usual treatment procedures, its immune system, reproduction and many other characteristics. Although the exact mechanisms by which temperament influences physiological responses continue to be studied, there is no doubt that temperament will play an increasing role in animal husbandry, especially in breeding and breeding [4].

Additionally, further research is still necessary to determine which temperament indicator provides the most valuable information to assess the effects on carcass and meat quality traits, and the time at which temperament should be measured requires investigation as well. For example, it is unknown whether assessing temperament at yearling period (before animals enter the feedlot), or at the end of the feedlot period (right before loading the animals to slaughter) is more beneficial for assessment. The answers to these questions have proven difficult, since the relationships between these traits are potentially influenced by several

underlying factors, among them, the way that cattle are handled, which is also not well described in many of the publications assessing this subject [5].

Purebred bulls of the Kazakh white-headed breed in the amount of 47 heads of 7-8 months of age were selected for the experiment. By the end of the trial, the bulls were about 11-12 months old. The animals were selected taking into account the characteristics of the breed, gender, age, origin and body weight. During the trial period, the bulls were in the same feeding and maintenance conditions. In our study, the diet of experimental bulls consisted of feed produced on the farm. The main feeds were: hay, haylage and concentrates. Feeding norms during the period of scientific research corresponded to the breed, live weight and physiological condition of the bulls.

In the research work, the EXAGO scanner, developed using the latest technologies and adapted to use in the field of animal science, was used to determine the lifetime quality of meat. The sensors of the device have three operating frequencies, when switching which it is possible to optimize the image for each specific case. The loading time of the device is 30 seconds. Images and clips can be stored in internal memory or on a USB device. The ultrasound scanner is based on digital technology, including a built-in processor and FPGA, EXAGO.

Determination of the thickness of subcutaneous fat and the area of the muscular eye in animals was carried out at the age of 12-14 months. The area of the muscular eye was measured by drawing a contour in the resulting figure. The thickness of the fat on the back was obtained from a distance of $\frac{3}{4}$ of the maximum muscle height between 12-13 ribs using an EXAGO ultrasonograph.

The final type of non-restrained test can be measured in two parts. The first is a flight score. This is a subjective score given to an animal based on its behavior upon exiting the chute. Again, there is no widely adopted version of this test, but the score is often assigned based on a four-point scale (4-walk; 1-jump). In conjunction with a subjective score, an exit velocity or flight speed can also be recorded. This technology was first introduced by Burrow et al. [6] to record the time taken for animals to cover a predetermined distance upon exiting the chute, or other confined area. The predetermined distance of 1.7 meters was selected as it is slightly shorter than the chute. Exit velocity is believed to be a more objective measurement of temperament in comparison to exit score or any other categorical variable.

The place of research is Akmola region, Republic of Kazakhstan. The study period is November 2022 - February 2023.

The tests were carried out in the morning before the feed was distributed, and at the time of the tests, the humidity was 80%, the pressure was 756 mmHg, the wind speed was 4.1 m/s and the temperature was 13 °C. To obtain descriptive statistics, the standard MS Excel add-in "Analysis Package" was used - a tool for analyzing descriptive statistics, into which sets of primary data for the studied years were transferred. The table below are data on the relationship between the temperament of bulls and the area of the muscular eye (Table 1).

Table 1. The relationship between the temperament of bulls and the ribeye area (n-47)

Temperament	The ribeye area M±m, cm ²	C _v ,%	δ	Max	Min
4	48,3±1,6	16	5,5	63,6	36,2
3	44,5±1,9	18	7,0	57,3	34,5
2	40,9±1,0	11	3,4	49	32,4
1	37,2±0,8	10	2,9	44	30,9

During the tests, it was found that the area of the muscular eye of steers with a calm temperament (4) was 48.3 ± 1.6 cm², and in steers with temperament 3 was 44.5 ± 1.9 cm², which is 7.9% less compared to steers with a calmer temperament. The areas of the muscular eye of bulls with temperament 2 and 1 were 40.9 ± 1.0 cm² and 37.2 ± 0.8 cm², respectively. The most aggressive bulls (with temperament 1) in terms of the area of the muscular eye, they were inferior to their peers with the most calm temperament by 23%. In other words, there is a high positive correlation between the types of temperament of bulls and the area of the muscular eye, which is also confirmed by studies by other authors (Aline Cristina Sant'Anna, Tiago da Silva Valente) [7]. The following are data on the relationship between the temperament of bulls and the thickness of subcutaneous fat (Table 2).

Table 2. The relationship between the temperament of bulls and the thickness of subcutaneous fat (n-47)

Temperament	Thickness of subcutaneous fat M±m, mm	C _v ,%	δ	Max	Min
4	3,1±0,3	21	0,54	4,34	2,51
3	2,9±0,3	25	0,60	4,1	1,67

2	2,8±0,3	23	0,51	4,01	1,67
1	2,8±0,2	19	0,46	3,34	1,67

According to the table, it can be noted that the largest thickness of subcutaneous fat in bulls with temperament 4 and is equal to 3.1 ± 0.3 mm, and in bulls with temperament 1, the thickness of subcutaneous fat was 2.8 ± 0.2 mm, which is 9.7% less compared to the most calm peers. While, the thickness of subcutaneous fat of bulls with temperaments 2 and 1 was at the same level. The thickness of subcutaneous fat of steers with temperament 3 was 2.9 ± 0.3 mm, which is 3.5% more compared to more aggressive steers. It should be noted that there is also a positive correlation between the types of temperament of bulls and the thickness of subcutaneous fat.

Some studies show that the temperament of bulls affects the thickness of subcutaneous fat and other characteristics of the carcass [8].

In conclusion, the results of these studies show that there is a positive correlation between the types of temperament of bulls and meat qualities, such as the area of the muscular eye and the thickness of subcutaneous fat.

The types of temperament of bulls can serve as an important criterion for breeding selection in order to preserve and improve meat qualities.

Список использованной литературы:

1. Baldassini, W. A. Meat quality traits of Nellore bulls according to different degrees of backfat thickness: a multivariate approach. [Text]/ Chardulo L. A. L., Silva J. A. V., Malheiros J. M., Dias V. A. D., Espigolan R. // Anim. Prod. Sci. 2017. 57:363–370. doi:10.1071/AN15120.

2. Behrends, S. M. Relationship of temperament, growth, carcass characteristics and tenderness in beef steers. [Text]/ Miller R. K., Rouquette Jr. F. M., Randel R. D., Warrington B. G., Forbes T. D. A., Welsh T. H., Lippke H., Behrends J. M., Carstens G. E., Holloway J. W. // Meat Sci. 2009. 81:433–438. doi:10.1016/j.meatsci.2008.09.003.

3. Ускенов Р.Б. «Қазақтың ақбас тұқымды бұқашықтарының еттілік қасиеттерін тірілей кезінде бағалау»[Мәтін]/ Аққаир Б.Ж., Исабекова С.А., Бостанова С.К., Нәсір Ж.Қ. // С.Сейфуллин атындағы Қазақ агротехникалық университетінің Ғылым жаршысы (пәнаралық) 2022. №3 (114). –Ч.1. - Б. 4-11

4. Braga J. S. Temperament effects on performance and adaptability of Nellore young bulls to the feedlot environment. [Text]/ Faucitano L., Macitelli F., Sant’Anna A. C., Méthot S., Paranhos da Costa M. J. R. // Livest. Sci. 2018. 216:88–93. doi:10.1016/j.livsci.2018.07.009.

5. Cafe, L. M. Temperament and hypothalamic-pituitary-adrenal axis function are related and combine to affect growth, efficiency, carcass, and meat quality traits in Brahman steers. [Text]/ Robinson D. L., Ferguson D. M., Geesink

G. H., Greenwood P. L. // *Domest. Anim. Endocrinol.* 2011a. 40:230–240. doi:10.1016/j.domaniend.2011.01.005.

6. Cafe, L. M. Cattle temperament: Persistence of assessments and associations with productivity, efficiency, carcass and meat quality traits. [Text]/ Robinson D. L., Ferguson D. M., McIntyre B. L., Geesink G. H., Greenwood P. L. // *J. Anim. Sci.* 2011b. 89:1452–1465. doi:10.2527/jas.2010-3304.

7. Campo, M. Finishing diet, temperament and lairage time effects on carcass and meat quality traits in steers. [Text]/ Brito G., De Lima J. S., Hernández P., Montossi F. // *Meat Sci.* 2010. 86(4):908–914. doi:10.1016/j.meatsci.2010.07.014.

8. Della Rosa, M. M. Performance, carcass and meat quality traits of grazing cattle with different exit velocity. [Text] / Pavan E., Maresca S., Spetter M., Ramiro F.// *Anim. Prod. Sci.* 2018. doi:10.1071/AN18064.