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OPTIMAL TIMING OF SLAUGHTERING HORSES OF DIFFERENT BREEDS IN THE SOUTHERN REGION OF KAZAKHSTAN

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The relevance of research. Kazakhstan, due to the production of meat products from local raw materials, has significant potential for the rationalization of nutrition, considering protein-lipid metabolism and human physiological needs.

Herd horse breeding is a traditional occupation of the indigenous peoples of the Republic of Kazakhstan. The development of herd horse breeding is based on the year-round use of natural fodder resources, which are of little use for other livestock industries. Since the herd horse breeding does not require large labor and capital costs, nowadays it is the lowest-cost branch of livestock industry. Experience and skills of the people in herd horses breeding contributes successful meat horse breeding.

Kazakh horses have excellent meat qualities. In this regard, it is especially relevant to study the chemical composition, functional and technological properties of horse meat. A comprehensive assessment of raw meat materials is needed to create effective technologies for its preparation and processing. The qualitative study of the horse meat and colt meat characteristics allows to better choose the possible age of slaughter of colts.

Purpose and objectives of the research. The purpose of this research was to study the meat productivity of young herd horses, the chemical composition, the nutritional value of colts and to give research based practical suggestions.

Object and methods of research. In 2019, we selected three groups of colts at the Abu breeding farm in Almaty region. The first group included colts born from Mughalzhar stallions of the Kozhamberdinsky inbreed type and local mares. The second group consisted of colts of local Kazakh breed. The third group was formed from colts of Kazakh riding breeds.

The studied colts were stratified by age, the difference in their birth dates did not exceed three days. The main weight gain was observed up to 18 months of age. At 18 to 24 months of age, due to the lack of nutrients and harsh temperature conditions, there is almost no increase in linear body indicators and weight gain.

Uneven growth of herd horses is a characteristic feature of them and has adaptive value, allowing the body of the horse to make optimal use of the changing conditions of the environment. The youngsters of the first experimental group consisting of Mugalzhar stallions are qualitatively different. These animals surpassed their peers in terms of precocity and had a live weight of up to 80% of the weight of adult horses at 18 months of age.

Between the ages of 18 and 30 months, there is a noticeable difference in the growth rate of colts. It was noted that the young horses of the Kazakh breed have the ability to stop growing in difficult conditions and consume feed nutrients only to maintain the vital functions of the body.

The herd content conditions correspond to the hereditary nature of Kazakh horses, while for the hybrid young stock the herd content of the southeast conditions is not favorable enough to realize its hereditary qualities.

The period from birth to 18 months of age is the most favorable in the life of a colt. Even during the first wintering, the colts receive mare's milk in addition to pasture food, and from the age of one year to 18 months they eat highly nutritious pasture vegetation and their mass increases intensively. When the colts overwinter for the first time on their own, we see a different picture. For the second wintering, the weight gain of young stock is very insignificant, and by the autumn control slaughter at 30 months we got the following results: Mugalzhar colts had a live weight of 352 kg, Kazakh colts - 320 kg, riding Kazakh colts - 326 kg. A significant increase was received by riding-Kazakh crossbreeds, Mugalzhar colts increased their weight least of all. This is due to the precocity of Mugalzhar and Kazakh horses.

With a decrease in growth rates in the late autumn period of life (30 months), young herd horses have an increased ability to deposit a significant amount of fat in the body. This ability of herd horses is also an adaptive quality developed in the process of adapting to harsh conditions.

One of the main indicators of meat productivity is the slaughter yield. The higher the slaughter yield, the higher the meat quality of the animals.[1]

As can be seen from Table 1, the carcass weight of six-month-old Mugalzhar colts was 128 kg. Over the next year, i.e. at 18 months, it increased by 77 kg or 60%, and at 30 months this figure has changed by only 11 kg, or 4.9%.

The colts of the Kazakh breed at six months gave a carcass weight of 107 kg, at 18 months this figure increased by 65 kg or 67%, and at 30 months - by 30 kg or 17.5%, respectively.

The carcass weight of colts of riding Kazakh crossbreeds at six months was 95 kg, at 18 months increased by 59%, and at 30 months by 33 kg or 21.8%.

The slaughter yield (%) in Mugalzhar colts in different control age periods changed slightly and remained quite high (56-57%). Kazakh colts also distinguished themselves by a stable indicator - within 54-55%. The slaughter yield of riding-Kazakh hybrids in herd conditions remained at the level of 51%.

Table 1 - Absolute and relative indicators of individual parts of the body of colts at different ages (n=4)

Age (months)	Indicator	1 group Mugalzhar		2 group Kazakh		3 group riding Kazakh	
		kg	%	kg	%	kg	%
6	Ante-mortem live weight Carcass weight Slaughter yield “karta” (colon) “kazy” (ribs)	228 125 - 3,5 18,0	- - 54,8 1,49 7,66	193 105 - 3,0 15,5	- - 54,4 1,54 7,95	181 91 - 2,6 15,1	- - 50,2 1,40 8,12
18	Ante-mortem live weight Carcass weight Slaughter yield “karta” (colon) “kazy” (ribs)	350 201 - 5,5 35,1	- - 57,4 1,55 9,89	307 170 - 5,0 29,0	- - 55,3 1,58 9,15	280 144 - 4,5 20,0	- - 51,4 1,56 6,94
30	Ante-mortem live weight Carcass weight Slaughter yield “karta” (colon) “kazy” (ribs)	375 216 - 6,4 38,1	- - 57,6 1,66 9,9	350 198 - 5,8 31,4	- - 55,1 1,57 8,51	342 171 - 5,2 24,0	- - 50,0 1,48 6,82

Chemical composition of horse meat. To establish the nutritional value of horse meat, we studied its chemical composition.

We studied: 1) protein fractions in the longest muscle of the back; 2) the ratio of tryptophan to oxyproline in colts of different ages.

Protein content changes with age and the percentage of fat increases from 4,1% at 6 months in riding Kazakh crossbreds to 8,8% at 30 months in Mugalzhar colts. Of course, the fat and protein content varied in different cuts. Thus, the maximum fat content was observed in the rib part (kazy) from 33% in colts at six months to 50% at 30 months.

Our study reviled that the caloric value of meat of Mugalzhar colts at 6,18 and 30 months is 5.9, 7.4, 7.8 MJ, Kazakh colts 5.5, 7.2, 7.1 MJ respectively, and riding-Kazakh crossbreeds 5.8, 6.6, 6.6 MJ respectively. For comparison reasons there are energy values of different meats in MJ per 1 kg of meat: beef - 7,2; veal - 6,1; lamb - 9,4; venison - 11,5; fat pork - 16,9; pork meat - 11,2; mature horses - 9,7-11,4.

A young horsemeat fat contains cholesterol and unsaturated fatty acid fractions in the most favorable, balanced state. For example, the fat of colt contains 41% saturated fatty acids and 59% unsaturated fatty acids, whereas beef fat has 59% saturated fatty acids and 41% unsaturated fatty acids. Herd horses have more polyunsaturated fatty acids due to the fact that they are kept in natural fattening pastures rather than being stabled and fattened. Also, significant amounts of

vitamin A, C, E, B vitamins, as well as calcium, potassium, copper, iron, zinc and a high content of organic acids are found in colts.

Unlike beef fat, colt fat is highly nutritious due to its high content (up to 24.3%) of linolenic fatty acid. It is 1.0% in beef fat and 0.5% in pork fat.

Compared to steers of the Kazakh white-headed breed horse meat has rather high protein index of the longest muscle of the back (m. Longissimus dorsi), which varies from 4.7 to 6.3. Even though horse meat has higher content of connective tissue. This is explained by the fact that horse meat has a higher content of high-grade proteins. Research results prove that horse meat has a complete set of essential amino acids with a favorable ratio of amino acids and can be attributed to dietary products. The nutritional value of proteins increases with age.[2]

Colts are the food brand of many northern peoples. In Yakutia, one of the main and traditional sources of raw meat is colts. It has been established that colt meat is a product of high biological and nutritional value, characterized by low calories and high protein content. The uniqueness of colt meat lies in the balance of the amino acid composition of proteins, and therefore it is referred to the food, which has dietary properties.

Numerous studies have shown that with age and growth of live weight the fullness of carcasses improves, but there is an increase in bone tissue, which leads to a decrease in the meatiness index. There is well known influ

According to the study of consumer related properties of cooked colt meat the age influence on organoleptic indicators, and to a greater extent on taste and smell. Especially on color (transparency) and aroma for broth.

Previous studies showed the optimum age of slaughter of colts to get the highest level of consumer related properties [3]. It is known that 150 g of boiled colt's meat provide daily requirement of the person in proteins on 81 %, fats - on 21 %, organic acids - on 18-19 %, in various vitamins - on 15-19 %, in iron - on 64 %, zinc - on 80 %, cobalt - on 45 %.

Conclusions and suggestions.

1. It has been established that the genetically fixed feature of horses of the Mugalzhar breed is high meat productivity (carcass weight of colts at 1.5 years is 201 kg and slaughter yield -57.4%), which is of great value for the further improvement of herd horses in the south of Republic of Kazakhstan.

2. To increase the production of horse breeding in the southern and south-eastern regions of the Republic of Kazakhstan it is necessary to widely practice breeding horses of the Mugalzhar breed.

3. In the production of national delicacies - kazy, kart, zhal, zhaya and getting tender young horsemeat in pastoral conditions it is advisable to raise horses of the Mugalzhar breed up to 1.5 years of age, which, given the increased precocity allows having the most rational herd structure with a breeding population of at least 40%.

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