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ВЕСТНИК

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН

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NAS RK is pleased to announce that Bulletin of NAS RK scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of Bulletin of NAS RK in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential multidiscipline content to our community.

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НАН РК сообщает, что научный журнал «Вестник НАН РК» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Вестника НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному мультидисциплинарному контенту для нашего сообщества.

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A. R. Akimbekov[1], K. Zh. Iskhan[2], S. S. Aldanazarov[2], Kh. A. Aubakirov[3], A. K. Karynbayev[3], T. S. Rzabayev[4], Mukhatai Geminguli[5], S. B. Asylbekov[2], A. D. Baimukanov[6]

[1]Kazakh Scientific Research Institute of Animal Breeding and Fodder Production, Almaty, Kazakhstan,
[2]Kazakh National Agrarian University, Almaty, Kazakhstan,
[3]M. H. Dulati Taraz State University, Taraz, Kazakhstan,
[4]LLP «Aktobe agricultural experimental station», Aktobe, Kazakhstan,
[5]Tarim University of Aral, China, Xinjiang,
[6]Russian state agricultural university – Moscow Agricultural academy named after K. A. Timiryazev, Moscow, Russia

MEAT PRODUCTIVITY OF YOUNG STOCK OF THE KAZAKH HORSE OF JABE TYPE IN THE CONDITIONS OF THE ALMATY REGION

Abstract. Growth and development indices of the Kazakh horses of Jabe type are expressed in intensive growth with favorable seasons of the year and slowdown in growth during the unfavorable seasons. At the same time, the difference in growth and development between stallions and fillies is insignificant.

Young stock of Kazakh horses of different ages during the period of feeding and intensive fattening is well added in live weight. With spring feeding, 12 months old foals gain 40.6 kg in live weight, 24 months old ones – 35.2 kg. During the autumn feeding period, 6 months old foals increase their live weight on 46.3 kg, 18 months old foals - on 37.2 kg and 30 monthly – 35.1 kg.

During the fattening, the increase in live weight was 47.3 kg in 6-month-old stallions, 45.8 kg in 12-month-old stallions, 40.7 kg in 18-month-olds, 41.6 kg in 24-month-olds and 5 kg in 30 month-olds.

Slaughter yield in 12 and 24 months old horses at feeding was 54.6–53.2%, at fattening, respectively, 55.3–53.8%. In the 6, 18, 30 months old stallions, during the autumn feeding, the slaughter yield was 56.7, 53.6, 52.3%, and during the winter fattening it was 56.9, 53.8 and 52.7%, respectively.

When studying the morphological composition of carcasses in stallions of different ages, it was established that 6-, 12-, and 18-month-old foals have a relative bone content higher than in 24- and 30-month-old foals, the content of pulp in the carcasses of 165.8 and 162.9 kg; the advantage is for 30-month-old colts. The content of connective tissue is higher in younger stallions from 3.3% to 3.8% compared to 24- and 30-month-old animals of 2.5-2.7%.

In terms of the class ratio of carcass parts in stallions of all ages from 43.3 to 46.5% fall on Class I, from 34.3 to 36.4% on Class II, from 15.0 to 28.3% on “out of class” (kazy and zhal) and from 6.1 to 7.4% go to Class III.

According to chemical composition, the meat of 24- and 30-month-old stallions differs from the meat of 6-, 12- and 18-month-old animals with a lower fat content and is more high-caloric. 1 kg of meat contains 2098–2398 kcal. The meat of young colts contains more protein 19.27–19.07% than fat 9.01–10.07% and is an easily digestible dietary product.

Keywords: Kazakh Jabe horse, meat productivity, slaughter yield, stallions, fillies, feeding, fattening, meat quality.

Introduction. The increase of meat production is currently the most crucial task facing domestic livestock breeders in Kazakhstan. In solving this problem, special attention is focused on productive horse breeding.

The growing demand of the population for horse meat causes the dynamic development of herd horse breeding due to the peculiarities of the structure of the feed balance of the republic associated with the vast pastures.

Due to its distinctive taste, horse meat has long been considered as a delicious dish, especially among the Kazakh and Kyrgyz peoples. For example, in Kazakhstan before the revolution, according to Yu.N. Barmintsev [1], from 7 to 17 pounds of horse meat and 50-150 buckets of koumiss were consumed per family per year. In most areas, horse meat ranked first, sometimes losing only to lamb.

L.V. Kashtanov [2], on the basis of his experiments with herd horses, reports that horses of higher and higher average fatness have a meat yield of 50-57%, of an average fatness - 45-50%, of a lower average - 40-45%. Chemical analysis of horse meat and fat shows their high nutritional value, not inferior to beef.

P.A. Fedotov [3] noted that during the slaughter of the Buryat horse, the average slaughter yield is 46.2%, and in the cross breeds obtained from the crossing of the Buryat mares with stallions of Don and roadster breeds, it reaches only 44.4%.

N.V. Anashina [4,5] investigated the morphological composition of primal cuts. According to her, different classes are different in their morphological composition. If the meat of the first and "out of the class" is distinguished by a high content of muscle and adipose tissue, the cut of the second, third classes is high in bone content.

N.V. Anashina, A.D. Malinovskaya [6] write that the bone content in the carcass decreases with age. If in young stock it is 26-31, then in adult horses it is up to 17-21%. The yield of adipose tissue increases from 3.4-6.0 to 8.2-10.8%, the proportion of muscle tissue rises from 62-68% to 70-72%.

A.E. Zhumagulov [7], studying the meat qualities of heavy-Kazakh cross breeds in comparison with purebred Kazakh ones, writes that hybrids' carcasses were 13 kg heavier and the slaughter yield was higher than 2%.

The meat quality of the stallions of the Kazakh breed of the Jabe type at different ages was studied by N.A. Kikebayev [8]. He found that the largest yield of carcass in a 3-day foal, then in colts at the age of 7 months, and the least - in 19-month-old colts.

I.N. Nechaev and N.A. Kikebayev [9] write that Kazakh stallions have an increase in kazy and zhal cuts with age from 9.48 at 7 months up to 14.15% at 31 months. The relative meats of I and II classes from the mass of carcass remain at the same level, but the cutability of the III class decreases.

There are very few scientific studies on the meat productivity of herd horses abroad. However, on the general meat products, separate works of Italian and French researchers can be cited. I.L.Catalano [10] writes that the slaughter yield of horses of good fatness is about 60%, young stock - about 50%, and foal-suckling constantly exceeds 60%.

I.Frigout [11], E.Rossier [12], Marten B-Rosse [13] tell about a good slaughter mass of meat foals. The colt carcasses contain a high percentage of muscles and relatively little fat (from 10 to 14%). Therefore, the authors compare the meat stallions with specialized beef cattle.

I.N.Nechaev [14] found that in horses, the composition of meat changes with age. So, if the fat content in the carcass in 6-month-old foals was 2.3-2.6%, in 1.5-year-olds - 3.2-3.8%, then in 2.5-year-olds due to the increase in the fat content, the quality of meat changes.

According to A.V. Venyarsky, horses of Kazakh breed with increasing fatness and age of horses, the percentage of fat and calorific capacity of meat increases, the percentage of moisture and protein is reduced [15].

P.S.Drugin [16] conducted a comparative study of the chemical composition of meat of the Yakut foals and foals of cross breeds from Russian heavy and Yakut breeds at 6 months of age. According to him, there is less water in the meat of Yakut foals (62% versus 67.1% in cross breeds) and more fat (15.5% versus 11.0%). Their protein content is about 20%.

In Bashkir foals, the pulp contains 75.7% of water, 2.07% of fat, and 20.02% of protein (I.N. Chebotarev [17]).

The high value of horse fat as a food product in comparison with other types of farm animals is noted by A.G. Plemyannikov [18]. Assessing the quality of fats derived from horses, camels, sheep, and cattle, he argues that the fat of horses has the best composition and nutritional qualities.

M.G. Dadebayev [19] studied the chemical and morphological composition of young stock meat of different ages during the fattening. At the same time, the author notes that if in meat of 18-month-old foals the outputs of moisture, fat, protein, and caloric content were 72, 32, 6.8; 19.83% and 1783 kcal, respectively, then in young animals at the age of 2.5 years - 67.83; 11.31; 19.68%, and 2197 kcal (fattening during 45 days).

A.I. Belyaev [20] characterizes the meat of Kushum horses, as having high nutritional qualities. With a slaughter yield of 53–58%, it contains about 18–20% of protein and 10–12% of fat in the carcass. The calorific capacity of the meat of Kushum horses is about 2000 kcal.

Analyzing the meat productivity of various breeds of animals, P.A. Fedotov [21] writes that the meat of farm animals, including horse, is valued for the content of native proteins, fats, and vitamins. The protein content in horse meat, depending on age, gender and fatness, ranges from 18 to 23%.

According to I. Hammond, adipose tissue is ontogenetically younger than other tissues and, in the degree of metabolic processes, is inferior, first of all, to muscle and bone. Therefore, during the period when the amount of nutrients entering the bloodstream is limited, the growth of adipose tissue is suspended and lipids are expended to provide energy to the animal body [22].

F. Popesku [23] notes that meat from a well-fed horse contains 73.16% of water, 21.6% of protein, 4.11% of fat and 1.2% of ash.

Many researchers have studied in detail the meat productivity of local horses and their cross breeds with cultural breeds in various zones of the republic.

At present, the development of horse breeding, especially herding, as an important productive industry, is receiving great attention in the Almaty region of the Republic of Kazakhstan, where there are up to 10 million hectares of steppe semi-desert pastures and about 25 thousand horse heads.

Of particular importance in the conditions of the Almaty region are the Kazakh horses of the Jabe type, which are well adapted to local climatic and feeding conditions, but do not have a sufficiently high live weight. One of the most effective ways to increase the live weight and meat productivity of Kazakh horses is the organization of feeding and fattening.

The aim of the study. To study the meat productivity of young stock of the Kazakh Jabe horses in different seasons of the year. The task of the research was to determine the feeding and fattening qualities of young stock under the conditions of the Almaty region.

Materials and methods of the research. Scientific and business experiments were conducted in 2016-2018 in the "Akboz" farm of the Panfilov district of the Almaty region, which was established in 2006 on the basis of the former Koktal state farm. In the farm, after an individual horse bonitation in 2016, an experimental herd was formed for studying the meat productivity of Kazakh horses of the Jabe type, depending on the different seasons of the year.

The cultivation technology of Kazakh horses of the Jabe type in the farm is typical for areas of herd horse breeding. Keeping animals is year-round pasture, with a seasonal change of pasture.

To study the growth and breeding of young stock, we observed the colts of the 2015 year of birth. All experimental young animals were grown in the same conditions of maintaining and feeding and were on the same type of pastures in all seasons within the experimental herd.

Control over their growth and development was carried out on the basis of periodic weighings, measurements and calculations of indices of body build at the age of 3 days, 3, 6, 12, 18, 24, 30 months.

Spring feeding of young horses was carried out from April to June, as during this period, there was widespread vegetation of ephemera and other herbs in the steppe and semi-desert zones of the Almaty region. Autumn feeding was conducted from September to November at the time of the secondary vegetation of steppe and semi-desert vegetation in this zone.

At setting and at the end of feeding, all experimental animals were subjected to basic measurements. The gains for the feeding period and the capacity to fattening were determined by weighing every 10 days. Experiments on spring and autumn feeding were carried out with two repetitions.

To determine the fattening capacities, the experiments were carried out on intensive fattening of colts in the summer and winter periods. Feeding was conducted on hay - concentrate diet. The diet consisted of steppe hay (Konirbas) and winter rye and crushed barley and was made up of fodder available on the farm. The norms of the All-Union Scientific Research Institute of Horse Breeding (VNIIK) [24] were taken as a basis. Rations were calculated based on the average live weight of horses - analogues, selected in the group.

During the feeding, the experimental foals were with a common herd on a pasture; when they were fed, they were placed in a closed pen, fenced off from a pipe fence. Concrete feed crips are installed along the pens.

Before experimental research on feeding and fattening of horses, individual weighing of the foals on a VSP-1 scale, equipped with a metal grid, marking, age determination and fatness of the foals were

carried out. Fatness was determined in accordance with the requirement of GOST 20079-74. Groups of horses were made up of animals similar in body weight, age and fatness [25].

In order to study the meat qualities and chemical composition of the meat of experimental horses, a control slaughter was conducted at the slaughterhouse of the Akboz farm according to the Federal Science Center of Animal Husbandry (FSCAH) methodology and in accordance with the technological instructions adopted in the meat industry.

Carcass quality was assessed by the development of muscle tissue, the presence of fatty deposits on the surface (watering) and the thickness of fat on the abdominal wall. In addition, we studied: the ratio between the meat mass (pulp) and bones in carcasses and cuts; the ratio of individual cuts in carcasses.

For a more objective assessment of the marketability of meat, a butchering of horse carcasses was carried out according to the scheme adopted for the state trading network of the Republic of Kazakhstan. Each of the cuts has a specific purpose. For the manufacture of zhal using fatty neck comb from the first thoracic vertebra. The carbonate is used to produce kazy. The cutting from the outer back lumbar part is used for the manufacture of the suret products. The upper layer of muscle tissue with fat irrigation from the hip part is used for the manufacture of the zhaya products.The muscle and fatty parts of the remaining cuts after boning and trimming of horse carcasses can go for the production of chuzhuk. Simultaneously with the cutting and boning of the carcass, samples were taken for chemical analysis. For this purpose, the meat content of each class was passed through a meat grinder with a fine grating of 2 mm in diameter, and after thoroughly mixing an average sample weighing 400 g of minced meat was taken. Then each minced meat sample was placed in previously dried porcelain cups and placed in a drying cabinet at 65 °C for determination of initial moisture[25]. Further chemical analysis of the meat was carried out according to generally accepted methods in the laboratory of KazSRIAH&FP LLP. The content of water, protein, fat and ash was determined in the meat of each class. Calorific capacity was established by calculation method in kilocalories.

Biometric processing was conducted according to the common methods [27].

Results of the research.

Growth and development of young stock of the Kazakh Jabe type horses. Studying the growth and development of young stock under conditions of herd keeping is of particular interest. In this regard, we studied the growth and development of foals of Kazakh Jabe horses from birth to 2.5 years of age under the conditions of year-round pasture maintenance (table 1).

In relation to parents 'measurements, the height at the withers and the metacarpus girth in foals at the age of three days is 65.2-64.0%, whereas the oblique body length and the chest girth make up only 50.6%

Table 1 – Age body measurements and live weight of Kazakh horses Jabe type of the 2015 year of birth

Age, months	n	Body measurements, cm				Live weight, kg
		heightatwithers	oblique body length	chest girth	metacarpus girth	
Stallions						
3 days	35	92.4±0.51	72.7±0.60	85.7±0.72	11.2±0.28	42.5±1.98
1	32	101.7±0.62	84.6±0.56	98.5±0.81	12.4±0.32	84.2±2.17
6	30	119.5±0.68	115.8±0.63	121.3±0.84	15.1±0.25	182.1±2.34
12	27	131.3±0.74	131.6±0.84	137.8±0.91	16.5±0.30	232.4±3.95
24	24	136.2±0.43	137.5±0.75	155.1±0.87	17.8±0.28	270.8±3.87
30	20	138.6±0.41	139.9±0.65	159.6±0.77	18.3±0.21	340.2±3.66
Fillies						
3 days	35	91.3±0.48	71.2±0.67	83.6±0.69	10.5±0.18	40.9±1.53
1	33	100.2±0.51	82.3±0.78	96.8±0.75	11.8±0.22	80.5±2.02
6	31	117.4±0.39	112.6±0.69	119.5±0.67	14.6±0.15	180.7±2.25
12	29	129.8±0.36	129.8±0.81	135.9±0.79	16.4±0.17	230.6±3.48
24	27	135.1±0.47	136.5±0.75	152.7±0.85	17.1±0.18	268.9±3.70
30	25	136.7±0.42	138.1±0.66	157.2±0.72	17.7±0.23	335.4±3.02

of the parents' measurements. Foal's high-leggedness at birth has an adaptive meaning, since it largely determines the foal's fast-gaitiness, which allows them to keep up with the herd as they move through pastures.

By two and a half years of age, height measurements of young animals reach 97.7-98.0% of parents' measurements.

In the first six months of life, foals showed the highest rate of growth intensity. During this period, the stallions increased in height at the withers on 27.1 cm, in oblique body length on 43.1 cm, in chest girth on 35.6 cm and metacarpus girth on 3.9 cm, and the fillies, respectively, on 26.1; 41.4; 35.9 and 4.1 cm.

From 6 months to 1 year of age, the growth rate slows down. In stallions, the height at the withers is increased by 11.8 cm, the oblique body length by 15.8 cm, the chest girth by 16.5 and themetacarpus girth by 1.4 cm, and in fillies by 12.4; 17.2; 16.4 and 1.8 cm respectively. From 1 to 2 years of age, in stallions these figures have already reached 4.9; 5.9; 17.3; 1.3 cm and in fillies - 5.3; 6.7; 16.8; 0.7 cm. The growth rate from 2 years to 2.5 years old for stallions was 2.4; 2.4; 4.5 and 0.5 cm, and for fill - 1.6; 1.6; 4.5; 0.6 cm respectively.

In the growth process, there is a change in the exterior of the foals, due to the predominant development of the axial part of the skeleton in comparison with the peripheral [28]. If from 3 days to 2.5 years of age, the height measurements at withers and metacarpus girth, connected with the growth of limbs, increased by 46.2 and 7.1 cm for colts and by 45.4 and 7.2 cm for fillies, whereas measurements of the oblique length of the body and chest girth associated with the growth of the axial part of the body increased in colts by 67.2 and 73.9 cm, in fillies by 66.9 and 73.6 cm.

Thus, foals grow most intensively in the first six months of life, then the growth rate gradually decreases.

Live weight of young animals not only characterizes the overall development of horses, but is a direct indicator of meat productivity. In the first month of life, the live weight of the young is doubled. For 27 days of the postembryonic period, the live weight of the foals increased by 41.7 kg, and the fillies increased by 39.6 kg. The period from birth to 6 months of age is most favorable in the development of the foal, which is associated with dairy nutrition and eating the spring grass. From 1 month to 6 months of age, the stallions gained 97.9 kg in live weight, fillies - 100.2 kg, while the average daily gain was 653 and 668 g.

From 6 to 12 months of age, the increase in live weight is slightly reduced and amounted to 50.3 kg for stallions and 49.9 kg for fillies. The average daily gain at the same time amounted to 279 g and 277 g.

From 12 to 24 months of age, the increase in live weight is reduced and amounted to 38.4 kg for stallions and 38.3 kg for fillies, the average daily gain was 107 and 106 g.

From 24 to 30 months of age, the increase in live weight gradually increased and amounted to 69.4 kg for stallions, for fillies - 66.5 kg, the average daily gain was 385 and 369 g.

For the full characterization of body type, body build indices are calculated, representing the percentage ratio of anatomically interconnected body measurements and live weight (table 2).

As can be seen from table 2, the index of format - as the ratio of the axial and peripheral parts of the skeleton - characterizes the body type of horses with age as in stallions and fillies gradually increases. A gradual increase in the format index is due to the fact that animals grow faster in length and width during life than in height at withers.

The high growth energy of the chest, compared with the growth rate of the chest limbs, causes a gradual rise in the wide body index during the life of the horses.

The massiveness index doubles up to 6 months of age, from 6 to 12 months of age it slightly decreases. The established pattern is due to the entrance to the first wintering of 6-month-old foals up to one-year-old. From 12 months to 30 months of age, the massiveness index rises by 20%.

Feeding qualities of the Kazakh horses of the Jabe type. Feeding of horses is one of the most important economic activities, allowing to increase the production of horse meat and to improve its quality by grazing on natural pastures. When studying the growth and development of young Kazakh horses, a general pattern of inconstancy in the increase in live weight over the seasons of the year has been established. Moreover, there is a high live weight gain in spring, a significant decrease in summer and an increase in growth in autumn, almost stopping in winter (table 3).

Table 2 – Body build indices of the Kazakh Jabe foals

Age, months	n	Body build indices, %			
		Format	Wide body	Bones	Massiveness
Stallions					
3 days	35	78.7	92.7	12.1	53.8
1	32	83.2	96.8	12.2	80.2
6	30	96.9	101.5	12.6	106.5
12	27	100.2	104.9	12.6	102.8
24	24	100.9	113.9	13.1	107.0
30	20	100.9	115.1	13.2	127.9
Fillies					
3 days	35	78.0	91.6	11.5	53.8
1	33	82.1	96.6	11.8	79.7
6	31	95.9	101.8	12.4	111.5
12	29	100.0	104.7	12.6	105.3
24	27	101.0	113.0	12.6	109.3
30	25	101.0	115.0	12.9	131.5

Table 3 – Results of spring feeding of the Kazakh Jabe stallions

Indices	Age, months	
	12	24
Number of heads	20	20
Duration of feeding, days	65	65
Live weight, kg: at the beginning of feeding at the end of feeding	 230.2±3.6 270.8±3.2	 271.8±4.1 307.0±3.5
Live weight gain: gross, kg daily average, g	 40.6±2.5 624.6±28.6	 35.2±2.8 541.5±31.2

The live weight gain in yearling stallions was 40.6 kg, with an average daily gain of 624.6 g, and in the two-year-olds - 35.2 kg and 541.5 g, respectively.

Autumn feeding by us was carried out from September 10 to November 19. During this period, the average daily gain in live weight for 6-month-old foals was 661.4 g, for 1.5 summer stallions - 531.4 g and 2.5-year-old foals - 501.4 g (table 4).

Table 4 – Results of the autumn feeding of young Kazakh Jabe horses

Indicators	Age, months		
	6	18	30
Number of heads	20	20	20
Duration of feeding, days	70	70	70
Live weight, kg: at the beginning of feeding at the end of feeding	 180.6±2.4 226.9±1.9	 260.5±3.2 297.7±2.8	 342.3±4.1 377.4±3.6
Live weight gain: gross, kg daily average, g	 46.3±2.2 661.4±31.5	 37.2±3.1 531.4±42.3	 35.1±3.4 501.4±37.6

It was established that the highest gains in live weight of colts are observed in the first month of feeding (September 10 - October 10). During this month of feeding, 6-month-old foals had an average daily gain of 827 g, 1.5-year-olds - 765 g, 2.5-year-olds - 701 g. In the second month of feeding, the average daily gain of colts was respectively 708; 687 and 643 g. In the final feeding period, the average daily gain in 6-month-old foals was 204 g, in 18-month-old foals - 101 g and in 30-month-olds - 92 grams.

Thus, during the spring and autumn feeding period, the greatest daily gains are observed in the first periods of feeding, when there is an intensive growth of muscle tissue, with the growth of adipose tissue the average daily gains gradually decrease.

Feeding qualities of the Kazakh horses of Jabe type. In summer and winter time, horses reduce their fatness, therefore, for the uninterrupted production of horse meat, in addition to the spring and autumn feeding, horse fattening is practiced regardless of age. Summer fattening was held from July 3 to September 3. Stallions were put on fattening at the age of 1 year and 2 years of age. Winter fattening was held from November 5 to January 5 for foals at the age of 6, 18, 30 months.

Fattening of horses was conducted with regard to their live weight and fatness. The conditions of keeping colts of all ages were the same.

The main diet consisted of fodder available on the farm: steppe hay (konirbas), winter rye of milky-wax ripeness and crushed phenomenon. Their quality was satisfactory. The composition and nutritional value of the rations are given in table 5.

Table 5 – Composition and nutritional value of actually eaten diets during the fattening of young horses

Feed type	Summer fattening		Winter fattening		
	Age, months				
	12	24	6	18	30
Steppehay, kg	2.5	3.0	2.0	3.0	3.0
Winterryehay, kg	3.0	3.0	3.0	3.0	5.0
Crushedbarley, kg	1.5	2.5	1.0	2.0	3.0
The diet includes:					
feed units	3.13	4.20	2.49	3.78	5.12
dry matter,kg	4.43	5.71	3.57	5.28	7.08
digestibleprotein, g	482	674	374	591	828
calcium, g	21.1	19.1	12.2	17.8	22.7
phosphorus, g	10.1	13.5	7.9	12.4	15.4
carotene, mg	113.7	127.2	100.5	127.0	159.5

The nutritional value of the actually eaten ration with summer fattening in 12-month-old-stallions was 3.13 feed units and 482 g of digestible protein, and in 24 monthly foals - 4.20 feed units and 674 g of digestible protein; in winter fattening in 6-month-old foals had a nutritional ration of 2.49 feed units and 374 g of digestible protein, in 18-month-old foals - 3.78 feed units and 591 g of digestible protein, in 30-month-old foals - 5.12 feed units and 828 g of digestible protein. Per 100 kg of live weight there was used 2.44 kg of dry matter of the ration for 12-month-old stallions, 2.09 kg of DM for 24-month-olds during the summer fattening, for 6-month-old foals - 1.97 kg of DM, for 18-month-old stallions - 2.03 kg of DM during the winter fattening. Per 1 kg of the gained live weight, 4.1 feed units were consumed for 12 monthly stallions, 6.06 feed units for 24-month-olds, 6.7 feed units for 6-month-old stallions, 4.7 feed units for 18-month-olds, and 7.8 feed units for 30-month-old stallions.

Stallions of different ages showed different growth rates during the fattening period (table 6).

For 60 days of fattening, the live weight gain per head, on average, in 12 monthly stallions was 45.8 kg or 19.7% to the preliminary weight, in 24 monthly foals - 41.6 kg or 15.2%, and in 6 monthly ones - 47.3 kg. or 26.1; in 18-month-old stallions - 40.7 kg. or 15.5, and in 30-month-olds - 37.5 or 10.8% to the preliminary weight. The greatest average daily gains were in 6 monthly foals - 788.3 g, then in 12 monthly foals - 763.3 g.

Table 6 – Live weight and live weight gain of foals during fattening (duration of experiments - 60 days)

Indicator	Summer fattening		Winter fattening		
	Age, months				
	12	24	6	18	30
Number of heads	20	20	20	20	20
Live weight, kg:					
at the beginning of fattening	232.3±3.7	273.6±4.1	181.3±3.2	263.2±3.8	348.1±5.2
at the end of fattening	278.1±3.5	315.2±3.9	228.6±3.3	303.9±3.5	385.6±4.6
Live weight gain:					
gross, kg	45.8±2.6	41.6±2.9	47.3±2.4	40.7±2.5	37.5±3.3
daily average, g	763.3±40.8	693.3±46.3	788.3±42.1	678.3±50.7	625,0±53,6

Meat productivity of foals after feeding and fattening. The meat qualities of horses are estimated by live weight, body measurements, as well as body build indices, calculated on the basis of measurements. As is known, these indicators do not yet give a complete description of the meat productivity of horses. In this regard, for an objective estimation of the productivity of animals, it is advisable to use indicators of dead weight and slaughter yield.

It has been established that during feeding and fattening, the mass of carcasses of stallions increases with age (table 7).

Table 7 – Meat productivity of stallions in different seasons of the year

Keeping method	Age, months	Number of heads	Pres laughter live weight, kg	Carcass mass, kg	Slaughteryield, %
Spring feeding	12	6	268.4	146.5	54.6
	24	6	306.2	162.9	53.2
Summer feeding	12	6	276.3	152.8	55.3
	24	6	312.1	167.9	53.8
Autumn feeding	6	6	223.6	126.8	56.7
	18	6	296.2	158.8	53.6
	30	6	378.7	198.1	52.3
Winter feeding	6	6	227.5	129.4	56.9
	18	6	301.4	162.1	53.8
	30	6	383.8	202.3	52.7

If the carcasses of the 12-month-old stallions weighed 146.5 kg at the spring feeding, after the autumn feeding in 18-month-old animals they were already 158.8 kg or 8.4% more. For the corresponding period, the mass of carcasses in 30-month-old foals increased by 35.2 kg or 21.6% compared with 24-month-old animals.

The same pattern is observed during summer and winter fattening. With age, the slaughter yield gradually decreases both during feeding and fattening. If the carcass yield at the autumn feeding season in 6-month-old stallions was 56.7%, then in 18-month-old stallions it was 53.6% and in 30-month-olds - 52.3%. At winter fattening the same picture is observed. Thus, these data indicate that spring - autumn feeding and summer-winter fattening of colts contributed to the achievement of a highdead weight of heavy carcasses, with the high slaughter yield.

As it is known, various products made from horse meat are in great demand among the local population. Such products as kazy, karta, zhal, zhaya, chuzhuk, suret and others are considered to be delicacies. They are distinguished by high nutritional value and good taste.

It should be noted that in Kazakhstan there is an increased demand for fat horse meat, as national specialty foods cannot be cooked from lean meat. Therefore, the production of fat horse meat is also stimulated by purchase prices in the trade network of the republic. So, horse meat of the first class is more

expensive than horse meat of the second one - by 29.2% and 2.5 times more than the cost of the third class. According toKazakhstan Regulations of technical specifications No. 82-62, the first class horse meat is carcass, in which kazy should be in the form of solid fatty deposits and have a thickness of at least 15 mm in the section around the white line.

To characterize the quality of carcasses, the thickness of the outer fat was measured. So the thickness of the fat layer "zhaya" on the comb of the neck in 30-month-old foals after feeding and fattening was 125-127 mm; in 24-month-old foals - 112-115 mm; in 18-month-olds - 85-87 mm; in 12-month-olds - 51-54 mm; and in 6-month-olds - 42-43 mm; on the abdominal wall the "kazy" in 30-month-old foals was 39-41 mm, in 24-month-olds - 27-29 mm, in 18-month-olds - 19-21 mm, in 12-month-olds 16-17 mm, and 6-month-olds - 11-13 mm; at tailhead - 15.3; 13.1; 10.1; 7.6; 4.8 mm, respectively.

Currently, the increasing demand for high-quality horse meat from the population and with a view to export necessitates obtaining the carcasses with a large meat yield, an even distribution of fat between the muscles and inside the muscles, with a thick layer of abdominal fat for making kazy, a relatively small specific mass of bones and tendons in the carcass . Therefore, the study of the morphological composition is an important qualitative indicator of the assessment of carcasses. The change in mass of different parts of the carcass is shown in table 8.

Table 8 – The ratio of the mass of different parts of the carcass when butchering

Keeping method	Age, months	Indicators	Parts of the carcass									
			lean	zhal	scapulo-humeral	knuckle	back	hind	kazy	flatbone	shank	the whole carcass
Spring feeding	12	kg	3.8	0.8	46.0	1.9	8.2	58.7	18.6	4.5	4.0	146.5
		%	2.6	0.5	31.4	1.3	5.6	40.1	12.7	3.1	2.7	100.0
	24	kg	4.3	1.5	51.9	2.5	9.6	61.0	22.3	5.0	4.8	162.9
		%	2.6	0.9	31.9	1.5	5.9	37.4	13.7	3.1	3.0	100.0
Summer fattening	12	kg	4.3	1.2	47.8	2.3	9.3	59.3	18.9	5.2	4.5	152.8
		%	2.8	0.8	31.3	1.5	6.1	38.8	12.4	3.4	2.9	100.0
	24	kg	4.2	1.7	52.3	2.8	10.7	62.6	23.4	5.3	4.6	167.9
		%	2.5	1.0	31.1	1.7	6.4	37.3	14.1	3.2	2.7	100.0
Autumn feeding	6	kg	2.4	0.4	42.6	1.7	7.2	51.1	14.6	3.5	3.3	126.8
		%	1.9	0.3	33.6	1.3	5.7	40.3	11.5	2.8	2.6	100.0
	18	kg	4.0	1.2	50.6	2.5	10.9	58.9	21.7	4.8	4.2	158.8
		%	2.5	0.7	31.9	1.6	6.9	37.1	13.7	3.0	2.6	100.0
	30	kg	4.8	2.3	60.9	3.6	12.2	75.1	25.4	7.5	6.3	198.1
		%	2.4	1.2	30.7	1.8	6.2	37.9	12.8	3.8	3.2	100.0
Winter fattening	6	kg	2.5	0.5	42.9	1.9	7.6	52.2	14.7	3.6	3.5	129.4
		%	1.9	0.4	33.1	1.5	5.9	40.3	11.4	2.8	2.7	100.0
	18	kg	3.9	1.4	51.3	2.6	11.0	60.7	22.2	4.9	4.1	162.1
		%	2.4	0.9	31.7	1.6	6.8	37.4	13.7	3.0	2.5	100.0
	30	kg	4.6	2.1	65.2	3.4	11.8	76.4	26.2	6.9	5.7	202.3
		%	2.3	1.0	32.2	1.7	5.8	37.8	13.0	3.4	2.8	100.0

From the data of table 8 it can be seen that the largest mass falls on the hind part of all age groups, then the scapulohumeral part and the cut of kazy and the back part go. The smallest amount falls on cuts like flat bone, lean, knuckles,and shanks.

When studying the morphological composition of horse carcasses, the ratio of trimmed meat, bones and tendons was determined. The research results are summarized in table 9.

It was established that the morphological composition of carcasses of stallions of different ages during feeding and fattening was not the same. The largest pulp yield in carcasses of 82.2 and 81.9% was

Table 9 – Morphological composition of horse carcasses

Keeping method	Age, months	Carcass weight, kg	Composition of the carcass					
			pulp		bones		tendons	
			kg	%	kg	%	kg	%
Spring feeding	12	146.5	115.7	79.0	25.8	17.6	5.0	3.4
	24	162.9	131.0	80.4	27.5	16.9	4.4	2.7
Summer fattening	12	152.8	121.8	79.7	26.0	17.0	5.0	3.3
	24	167.9	135.8	80.9	27.7	16.5	4.4	2.6
Autumn feeding	6	126.8	98.6	77.7	23.4	18.5	4.8	3.8
	18	158.8	127.1	80.0	26.8	16.9	4.9	3.1
	30	198.1	162.9	82.2	30.3	15.3	4.9	2.5
Winter fattening	6	129.4	100.6	77.7	24.2	18.7	4.6	3.6
	18	162.1	130.1	80.2	27.2	16.8	4.8	3.0
	30	202.3	165.8	81.9	31.5	15.6	5.0	2.5

in foals at the age of 30 months. The relative content of bones was higher in 6-month-old stallions of 18.5-18.7% compared with other age groups. The lowest tendon content is observed in 30 monthly foals - 2.5% and in 24 monthly foals - 2.7-2.6%. Per 1 kg of bones, it was obtained 4.2 kg of meat in 6-month-old foals, in 12-month-olds - 4.5-4.9 kg, in 18-month-olds - 4.7-4.8 kg, and in 24-month-olds - 4.8-4.9 kg and 30 months - 5.4-5.3 kg.

Individual parts of the carcass are characterized by different ratios of muscular tissue with other tissues. This is due to the peculiarities of the anatomical structure and the nature of the work performed by one or another part of the body. The best in nutritional terms are the parts of the carcass containing the greatest amount of muscle and adipose tissues, with a low content of bones and tendons [28-31].

The class ratio of horse carcass meat can be judged from the data in table 10. It has been established that, during feeding and fattening, depending on age, there is a change in the yield of individual cuts in the carcass composition. For example, the cut “out of class” has an increasing character with age.

Table 10 – The ratio of the mass of parts of the carcass by classes

Keeping method	Age, months	Total in the carcass		Out of class		I class		II class		III class	
		kg	%	kg	%	kg	%	kg	%	kg	%
Spring feeding	12	146.5	100	19.4	13.2	66.9	45.7	50.5	34.5	9.7	6.6
	24	162.9	100	23.8	14.6	70.6	43.3	56.9	35.0	11.6	7.1
Summer fattening	12	152.8	100	20.1	13.1	68.6	44.9	53.0	34.7	11.1	7.3
	24	167.9	100	25.4	15.1	73.3	43.7	57.6	34.3	11.6	6.9
Autumn feeding	6	126.8	100	15.0	11.8	58.3	46.0	46.1	36.4	7.4	5.8
	18	158.8	100	22.9	14.4	69.8	44.0	55.4	34.9	10.7	6.7
	30	198.1	100	27.7	14.0	87.3	44.1	68.4	34.5	14.7	7.4
Winter fattening	6	129.4	100	15.2	11.7	59.8	46.2	46.5	36.0	7.9	6.1
	18	162.1	100	23.6	14.6	71.7	56.2	56.2	34.7	10.6	6.5
	30	202.3	100	28.3	14.0	88.2	72.1	72.1	35.6	13.7	6.8

If in 12-month-old stallions during spring feeding, the “out of class” cut was 19.4 kg, then in 24-month-old stallions it was already 23.8 kg or 4.4% more. At summer fattening the same picture is observed. During the autumn feeding and winter fattening, the out-of-class cut from 30-month-old stallions was higher by 13.1 kg compared to 6-month-old stallions and 19.9% higher compared to 18-month-old animals. Back and hind parts of carcasses belong to the first-class cut, which ranges from 66.9 to 88.2 kg, depending on the age of foals, class II includes the scapulohumeral (shoulder-blade) part and flat bone (46.1-72.1 kg), Class III includes lean, knuckle and shank (7.4-13.7 kg).

First class meat in carcasses takes up almost half of the mass (43.3-46.2%), depending on the age of animals. Class II takes from 34.3 to 36.4% of the carcasses weight. Class III contains a large number of bones and tendons rather than meat and it ranges from 5.8-7.4%.

Based on research conducted on the study of the morphological composition and the ratio of horse carcass meat by classes, it can be concluded that with the organization of feeding and fattening of horses, the output of the meat content in the carcass increases and the class ratio in favor of higher classes improves.

The chemical composition of the meat of young Kazakh Jabe horses. The chemical composition of meat is one of the important indicators that give an idea of the nutritional value of meat. The nutritional value of horse meat is in direct proportion with the level of feeding and maintenance, age and fatness of the horse [35].

It was found that the chemical composition of meat of various classes in foals of different ages at feeding and fattening is not the same.

The highest fat content in all age groups is observed in the “out of class” cut, and then in descending order - in the I, II and least of all - in Class III. The more fatty meat was in 30 monthly stallions.

With age, a decrease in moisture and protein is observed. If the 6-month-old stallions had 70.59% of moisture in the carcass at feeding, 70.37% at fattening, and the protein content was, respectively, 19.27% and 19.29%, then at the age of 30 months, there were: moisture - 64.43-64.27%, protein 15.95-15.99%. A similar regulation is observed for all classes of carcass cuts.

As the class of meat decreases, a gain in the moisture and protein content is observed. The ratio of moisture to protein regardless of the class of meat and the age of stallions was more or less constant from 3.5 to 3.7. This is due to the fact that the moisture and protein in meat is in a biologically bound state. The content of ash in the meat both with the age of horses and with the difference in class remains without significant changes.

The energy value of horse meat of different ages varies when feeding and fattening. The highest meat calorific capacity of 2385-2398 kilocalories was in 30-month-old stallions in comparison with stallions of other ages. Meat of 6-month-old and 12-month-old foals contains more protein and less fat and it is a dietary food product. For the production of high-value dietary horse meat in the farm, it is necessary to have a large proportion of mares in the herd, which allows the 6- and 12-month-old stallions to be slaughtered;for the production of more fatty and high-calorific horse meat, 30 monthly foals should be slaughtered after feeding and fattening.

Qualitative protein indicator of meat. It is known that muscle tissue includes sarcoplasm proteins and myofibrils, which are full-fledged and contain all the essential amino acids. Proteins of the connective tissue do not contain some essential amino acids, in particular, tryptophan. At the same time, up to 14% of connective tissue proteins account for the oxyproline amino acid, which is absent in full-fledged proteins. Therefore, the content of full-fledged proteins in meat is identified by tryptophan, and the defective ones - by hydroxyproline. The ratio of tryptophan to hydroxyproline is called a protein-based quality indicator and characterizes the full-value of meat proteins, being one of the main criteria for its quality.

The protein full-value of meat obtained from stallions of different ages is not the same, it depends on which muscles the study was conducted. The muscles of different anatomical parts of the body differ dramatically in the quality of proteins [29].

In this respect, the most valuable muscle is the semitendinosus and the longissimus muscle of the back, followed by the semimembranosus, the latissimus, the dentate ventral muscle, and the lowest quality is characterized by biceps of the shoulder.

The highest values of the quality protein indicator were obtained in colts at the age of 6 and 12 months. The value of the indicator of protein usefulness was 5.8, which indicates a very high biological (food) value of meat. With the age of horses, the biological value of meat decreases, and by the age of 30 months, the protein quality index averaged 4.5 on average.

By-products, internal fat, and technical raw materials. Considering the growth dynamics of organs attributable after the horse processing for meat to the 1 category by-products, we see that with the age of horses their relative weight drops noticeably. Thus, the yield of by-products of the first category decreases with age of horses from 4.6% in 3-day-olds to 3.0% in 30-month-old foals.

The greatest mass in the number of organs attributed to the offal of class 1 is for the heart and liver. Their relative weight also declines markedly with the age of the horses - from 1.3% and 1.7%, respectively, in 6-month-olds to 0.8% and 1.5% in 30-month-old stallions. Of the other organs of this category, the relative mass of the tongue decreases sharply, the relative mass of the kidneys remains at the same level, and the output of meat trimming increases slightly.

The change in the output of various organs noted above is a consequence of the unequal growth rate at different periods of life. Thus, among the by-products of the 1st class, the biggest gain in the output by 15.5 times is for the meat trimming and the smallest - the tongue, only 1.5 times during 2.5 years of life. The relative weight of the intestine, spleen, head with the age decreases noticeably, and the stomach, on the contrary, increases. Despite this, the yield of by-products of class II, in general, remains without significant changes.

The intestine in 6-month-old foals is more developed than the stomach. With the age, a decrease in the content of both the small and the large bowel is observed. However, the decrease in the relative mass of the large bowel is stronger. The relative mass of the small and large bowel sections from the pre-slaughter mass was respectively equal to 1.46% and 1.24% at 6 months, 1.40 and 1.16 at 12 months, at 1.28 and 1.01 at 18 months, 1.21 and 1.00 at 24 months, 1.19 and 1.03% in 30 months. From 6 months to 2.5 years of age, the weight of the small and large bowels of horses increased by 6.5 and 5.2 times, respectively.

The intestines are used as envelopes for chuzhuk and kazy. Therefore, its length also has a definite meaning.

The length of the large and small bowels was equal, respectively, at 6 months - 13.0 and 2.6 meters, at 12 months - 14.0 and 3.0 meters, at 18 months - 14.5 and 3.1 meters, at 24 months - 15.3 and 3.1 meters, at 30 months - 16.3 and 3.2 meters.

The full fat segmented intestine of horses is used to produce a karta. At 6, 12, 18, 24 and 30 months of age, its weight averaged 1.42±0.0085 kg, 2.23±0.081 kg, 2.43±0.116 kg, 2.55±0.163 kg, 3.08±0.072 kg, respectively.

During slaughter, in 6-month-old stallions, an internal fat of 0.84 ± 0.08 kg was obtained; at subsequent ages, an increase in the mass of internal fat was observed. At the age of 12, 18 and 24 months of stallions, the mass of internal fat is 1.2±0.01 kg, 1.3±0.05 kg and 1.6±0.03 kg, respectively. Especially intensively increases the content of internal fat in the third year of life. At slaughter at 2.5 years of age, the internal fat of 2.2±0.08 kg was obtained.

In addition to meat and meat products in the processing of horses the raw materials for consumer goods and food industries are received. The most valuable of them are jacket, blood and legs (table 11).

Table 11 – Change in the yield of technical raw materials and slaughter products of the Kazakh horses of Jabe type (n = 6 of each)

Indicators	Age, months				
	6	12	18	24	30
Technical raw materials, kg including:					
blood, kg	9.1±0.23	11.9±0.21	14.1±0.35	15.6±0.27	16.8±0.39
legs, kg	4.3	5.8	7.0	7.5	7.8
jacket, kg	13.1±0.21	14.0±0.43	15.6±0.26	16.42±0.34	21.5±0.31
Jacket length, cm	175±1.87	181±2.83	191±2.17	197±2.76	204±2.51
Jacket width, cm	128±1.59	138±2.21	144±2.03	161±2.45	165±1.92
Jacketarea, m^2	2.24	2.50	2.75	3.17	3.37

It has been established that the growth of jacket in horses is quite high and its weight increases from 13.1 kg in 6-month-old foals to 21.5±0.31 kg, or by 64.1%, by 2.5 years of age. During this period, the area of the jacket increases from 2.24 to 3.37 sq. m or by 50.4%. Consequently, the unit of jacket area with age of horses becomes heavier. So, if 1 sq. m of jacket at 6 months of age had a weight of 5.8 kg on average, then at 2.5 years of age it is equal to 6.4 kg. When comparing the size of the jackets for a 2-year

period, an increase in length by 1.5 times is found, and in width - 2.0 times, that is, the jacket becomes relatively shorter and wider.

It should be noted that the jacket of foals, like fur raw materials, are used completely insufficiently. Positive experience in this regard is available only in the Sakha Republic.

Blood is a valuable raw material for the production of food, medical, feed and technical products. With the age of horses, the amount of blood increases from 9.1 kg in the 6-month-old stallions to 16.8 kg in 2.5 year-olds, or by 84.6%.

А. Р. Акимбеков[1], К. Ж. Исхан[2], С. С. Алданазаров[2], Х. А. Аубэкиров[3], А. К. Карынбаев[3], Т. С. Рзабаев[4], Мухатай Гемингули[5], Ш. Б. Әсильбеков[2], Д. А. Баймуканов[6]

[1]Қазақ мал шаруашылығы және азық өндірісі ғылыми-зерттеу институты, Алматы, Қазақстан,
[2]Қазақ ұлттық аграрлық университеті, Алматы, Қазақстан,
[3]М. Х. Дулати атындағы Тараз мемлекеттік университеті , Тараз, Қазақстан,
[4]ЖШС Ақтөбе ауылшаруашылық тәжірибелік станциясы, Ақтөбе, Қазақстан,
[5]Тарим университеті, Арал, Қытай,
[6]Жоғары білім беру саласындағы федералдық мемлекеттік бюджеттік білім беру саласының мемлекеттік орталығы – К. А. Тимирязев атындағы Мәскеу аграрлық академиясы, Мәскеу, Ресей

АЛМАТЫ ОБЛЫСЫ ЖАҒДАЙЫНДАҒЫ ҚАЗАҚ ЖАБЫ ЖЫЛҚЫ ТИПІНІҢ ЖАС ТӨЛДЕРІНІҢ ЕТ ӨНІМДІЛІГІ

Аннотация. Қазақ жабы жылқылардың өсу мен даму көрсеткіштері жыл маусымдарының қолайлы мерзімінде аңықталады және қолайсыз мерзімде керісінше баяу өсу қарқынымен көрінеді. Сонымен қатар құлындар мен байталдардың арасындағы өсу мен дамудың айырмашылығы шамалы. Азықтандыру кезеңінде және қарқынды бордақылау кезеңінде әр түрлі жастағы қазақ жылқылардың жас төлдерінің тірі салмақты жақсы қосыды. Көктемгі азықпен жайылған 12 айлық жабағылар 40,6 кг тірі салмаққа артады, 24 айда – 35,2 кг. Күзгі жайлым кезеңінде 6 айлық жабағылар 46,3 кг, 18 айда 37,2 кг және 30 ай сайын 35,1 кг салмақ арттырады. Бордақылау кезінде 6 айлық жабағылар 47,3 кг, 12 айлық тайлар 45,8 кг, 18 айлықта 40,7 кг, 24 айлық 41,6 кг және 30 айда 37,5 кг құрады.

Жылқы 12 және 24 айда сойыс ет шығымы 54,6–53,2%, бордақылау кезінде тиісінше 55,3–53,8% құрады. Күзгі жайлымуақытында 6, 18, 30 айлық құнандар 56,7, 53,6, 52,3%, ал қысқы кезеңде тиісінше 56,9, 53,8 және 52,7% құрады.

Әртүрлі жастағы құнандардың ет тушасының морфологиялық құрамын зерттегенде 6, 12, 18 айлықтағыларымен салыстырғанда сүйек мөлшері 24 және 30 айлықтағылардан жоғары екендігі анықталды, 30 айлық құнандардың ұшадағы ет мөлшері 165,8 және 162,9 кг құрады. Ұлпалардың байланыс ерекшелігі 24–30 айлық жануарлармен салыстырғанда 2,5-2,7%-ға, жас құнандарға қарағанда 3,3%-дан 3,8%-ға жоғары болды.

Барлық жас аралығындағы құнандардың ұшасының ет бөліктерінің сорттықғы мынаған сәйкес 43,3%-дан 46,5%-ға дейін I сорт, 34,3%-дан 36,4%-ға дейін II сорт, 15,0%-дан 28,3%-ға дейін «сортқа жатпайтын» (қазы және жал) және III сорт үшін 6,1%-дан 7,4%-ға дейін.

Химиялық құрамы бойынша 24 және 30 айлық жастағықұнандардың еті басқа жастағылардың етінен айырмашылығы бар 6, 12 және 18 айлықтағыларда майы аз және құрамында жоғары калорияда болып табылады. 1 кг ет 2098–2398 ккал болды. Жас құнандардың етінде 9,10–10,07% майға қарағанда 19,27–19,07% артық ақуыз бар және бұл оңай сіңімді диеталық өнім.

Түйін сөздер: қазақтың жабы жылқысы, ет өнімділігі, сойыс шығымдылығы, құнан, байтал, жайып-семірту, бордақылау, ет сапасы.

А. Р. Акимбеков[1], К. Ж. Исхан[2], С. С. Алданазаров[2], Х. А. Аубэкиров[3], А. К. Карынбаев[3], Т. С. Рзабаев[4], Мухатай Гемингули[5], Ш. Б. Әсильбеков[2], Д. А. Баймуканов[6]

[1]Казахский научно-исследовательский институт животноводства и кормопроизводства, Алматы, Казахстан,
[2]Казахский национальный аграрный университет, Алматы, Казахстан,
[3]Таразский государственный университет им. М. Х. Дулати, Тараз, Казахстан,
[4]ТОО «Актюбинская сельскохозяйственная опытная станция», Актюбе, Казахстан,
[5]Таримский университет г. Арал, КНР,
[6]Российский государственный аграрный университет – Московская сельскохозяйственная академия им. К. А. Тимирязева, Москва, Россия

МЯСНАЯ ПРОДУКТИВНОСТЬ МОЛОДНЯКА КАЗАХСКОЙ ЛОШАДИ ТИПА ЖАБЕ В УСЛОВИЯХ АЛМАТИНСКОЙ ОБЛАСТИ

Аннотация. Показатели роста и развития казахских лошадей типа жабе выражается в интенсивном росте при благоприятных и снижении темпов роста в неблагоприятные сезоны года. При этом разница в росте и развитии между жеребчиками и кобылками несущественна.

Молодняк казахских лошадей различного возраста в период нагула и интенсивного откорма хорошо прибавляют в живой массе. При весеннем нагуле 12 месячные жеребчики прибавили в живой массе 40,6 кг, 24 месячные – 35,2 кг. При осеннем нагуле 6 месячные жеребята увеличивают живую массу на 46,3 кг, 18 месячные 37,2 кг и 30 месячные 35,1 кг.

При откорме прирост живой массы составил у 6-ти месячных жеребчиков 47,3 кг, у 12-ти месячных – 45,8 кг, у 18-ти месячных 40,7 кг, у 24 месячных 41,6 кг и 30 месячных – 37,5 кг.

Убойный выход у лошадей 12 и 24 месяцев при нагуле составил 54,6–53,2%, при откорме соответственно 55,3–53,8%. У 6 , 18, 30 месячных жеребчиков при осеннем нагуле убойный выход равнялся 56,7, 53,6, 52,3%, а при зимнем откорме соответственно 56,9, 53,8 и 52,7%.

При изучении морфологического состава туш у жеребчиков различного возраста установлено, что у 6, 12, 18 месячных жеребчиков относительное содержание костей выше чем у 24 и 30 месячных жеребчиков, по содержанию мякоти в туше 165,8 и 162,9 кг преимущество было у 30 месячных жеребчиков. Содержание соединительной ткани был выше у более молодых жеребчиков от 3,3 до 3,8% в сравнении с 24 и 30 месячными животными 2,5–2,7%.

По сортовому соотношению частей туши у жеребчиков всех возрастов от 43,3% до 46,5% приходится на I сорт, от 34,3 до 36,4% на II сорт, от 15,0 до 28,3% на “вне сорта” (қазы и жал) и от 6,1 до 7,4% на III сорт.

По химическому составу мясо жеребчиков 24 и 30 месячного возраста отличается от мяса животных 6,12 и 18 месячного возраста меньшим содержанием жира и является более калорийным. В 1 кг мяса содержалось 2098–2398 ккал. В мясе молодых жеребчиков содержится больше белка 19,27–19,07% нежели жира 9,01–10,07% и является легкоусвояемым диетическим продуктом питания.

Ключевые слова: казахская лошадь жабе, мясная продуктивность, убойный выход, жеребчики, кобылки, нагул, откорм, качество мяса.

Information about authors:

Akimbekov Amin Richardovich, Doctor of Agricultural Sciences, Chief Researcher of the Horse Breeding Department of the Kazakh Scientific Research Institute of Animal Breeding and Fodder Production, Almaty, Kazakhstan; amin.akimbekov@bk.ru; https://orcid.org/ 0000-0002-1697-8113

Iskhan Kairat Zhaleluly, Candidate of Agricultural Sciences, Associate Professor, Associate Professor of the Department of Physiology, Morphology and Biochemistry named after Academician N. Bazanovoy of the Kazakh National Agrarian University, Almaty, Kazakhstan; Kayrat_Ishan@mail.ru; https://orcid.org/ 0000-0001-8430-034X

Aldanazarov Smatulla Smanovich, Candidate of Biological Sciences, Professor of the Department of Physiology, Morphology and Biochemistry named after N. V. Bazanova, Almaty, Kazakhstan; Aldanazarov_Smatulla@mail.ru; https://orcid.org/0000-0002-5921-3751

Aubakirov Khamit Abilgazievich, Candidate of Agricultural Sciences, Associate Professor of the Department of Biotechnology, M. H. Dulati Taraz State University, Taraz, Kazakhstan; hamit_a57@mail.ru; https://orcid.org/0000-0003-2670-4834

Karynbayev Amanbay Kambarbekovich, Doctor of Agricultural Sciences, Academician of the Russian Academy of Natural Sciences, Professor of the Department of Biotechnology, M. H. Dulati Taraz State University, Taraz, Kazakhstan; Uzniijrtaraz@mail.ru; https://orcid.org/0000-0003-4717-6487

Rzabayev Tolybek Serikbayevich, Candidate of Agricultural Sciences, Chief Researcher of the Horse Breeding Department of Aktobe Agricultural Experimental Station LLP, Aktobe, Kazakhstan; rzabaev@mail.ru; https://orcid.org/ 0000-0003-4650-5816

Geminguli Mukhatai (Gemingguli Muhatai), Candidate of Agricultural Sciences, Professor at the Tarim University of Aral, China, Xinjiang; gmuhatai@bk.ru; https://orcid.org/ 0000-0002-1199-443X

Asylbekov Shyngys Bazarbekovich, Master of Agricultural Sciences, PhD student of the department "Livestock production technology". Kazakh National Agrarian University, Almaty, Kazakhstan; shynggys.asilbekov@gmail.comhttps; https://orcid.org/0000-0002-9347-0137

Baimukanov Aidar Dastanbekuly, of the Faculty of Zootechnics and Biology of the Russian State Agrarian University – Moscow Agricultural Academy named after K. A. Timiryazev, Moscow, Russia; aidartaidar98@mail.ru; https://orcid.org/0000-0001-9669-864X

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