EFFICIENCY OF PRODUCTION OF HORSE MEAT AND KOUMISS FROM THE KAZAKH HORSES OF THE ADAI OFFSPRING

Abstract. Kazakh horses of the Adai offspring are the standard of herd horses in the desert zone of the Mangyshlak Peninsula. They perfectly adapt to the area of their reproduction, hardy to long-distance driving to various pastures. With an insignificant expenditure of labor and money, young Adai horses reach 340-350 kg of live weight by the age of 2.5 years. When slaughtering stallions, the carcass weight reaches 185-195 kg. High-milk mares for 105 days of lactation produce from 590 liters to 675 liters of marketable milk. The rates of slaughter yield in Adai young stock were also comparatively lower than that of stallions of the Mangystau population and averaged to 53.9 %, while the rate of slaughter yield in horses of the Mangistau population was 55.1 %.

When studying the dairy productivity of both groups of mares, it was found that mares of the Adai offspring have higher dairy productivity than the Mangistau population under pasture conditions. Over 105 days of lactation, the milking capacity of the mares of the Adai offspring was 1617.0 liters, in the Mangistau population it was 1413.3 liters, and commercial milk yield was 674.1 and 590.1 liters, respectively. Thus, the yield of the Adai mares exceeds by 14.2 % or 84.0 liters in comparison with the Mangistau population.

Profitability in the horse meat production reaches from 70 % to 74 % and in koumiss production – 13.9-16.9 %.

Keywords: live weight, carcass, pulp, bones, lactation, prime cost, profitability.

Introduction. In the Republic of Kazakhstan, horse breeding has always occupied a special position among other branches of productive livestock. For the countries of the Eurasian Economic Union, productive horse breeding has a special value at there cost of the local breeding [1].

Of great importance for horse breeding of the Mangyshlak Peninsula is the Kazakh horse of the Adai offspring, created by native selection [2].

Adai horses are bred in different soil and climatic zones of the Caspian Depression of the Republic of Kazakhstan. They can be kept on pasture throughout the winter, extracting food from under the snow. Therefore, in the conditions of the Mangystau and Mangistau peninsulas, the development of horse breeding is of considerable importance, as well as the use of mares for dairy products – mare's milk and koumiss production.

The object of the research. Mangistau population and Adai offspring of the Kazakh horses in the farm Taushyk LLP of the Mangystau region.

The aim of the research. To determine the economic efficiency of horse meat and koumiss production in the desert zone of the Mangistau region.

Methods of the research. The study of the meat productivity of the Mangistau population and the Adai offspring of the Kazakh horses was carried out by slaughtering 2.5-year-old stallions after autumn feeding at the Taushyk LLP slaughterhouse according to the methodology of the All-Russian Research Institute of Horse Breeding [3].

Carcass qualities were evaluated according to the development of muscle tissue, the presence of fatty deposits on the surface (watering) and the thickness of fat on the abdominal wall – kazy [4].

Commodity milking capacity of mares was determined monthly during lactation using the control milk yield method, twice a month on two adjacent days. Dairy productivity was calculated taking into account milk sucked at night by a colt, according to the formula of professor I.A. Saigin [5].
The economic efficiency was calculated according to the accounting data of Taushyk LLP. All experimental data were biometrically processed according to the common methods [6].

**Research results.** To establish the dairy productivity of the Mangystau population and the Adai offspring of the Kazakh horses at the slaughterhouse of Taushyk LLP, 2.5-year-old colts were slaughtered after the autumn feeding. For control slaughter, horses were selected that are characteristic for each population and offspring with close indicators of live weight to the average data. The results of the control slaughter of the colts are presented in table 1.

It was found that the stallions of the Adai offspring were inferior to the analogs of the Mangystau population by 8.6 kg in carcass weight. The rates of slaughter yield in Adai young stock were also comparatively lower than that of stallions of the Mangystau population and averaged to 53.9 %, while the rate of slaughter yield in horses of the Mangystau population was 55.1 %.

**Table 1 – Results of the control slaughter of colts (n= 4 heads of each)**

<table>
<thead>
<tr>
<th>indicators</th>
<th>Mangistau population</th>
<th>Adai offspring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-slaughter live weight, kg</td>
<td>359.5 ± 3.2</td>
<td>351.7 ± 3.5</td>
</tr>
<tr>
<td>Carcass weight</td>
<td>198.1 ± 2.9</td>
<td>189.5 ± 1.6</td>
</tr>
<tr>
<td>Slaughter yield, %</td>
<td>55.1 ± 0.1</td>
<td>53.9 ± 0.2</td>
</tr>
</tbody>
</table>

When studying the morphological composition in each type and on the whole carcass, the ratio of pulp and bone was determined (table 2).

**Table 2 – the ratio of pulp and bone according to types**

<table>
<thead>
<tr>
<th>Carcass joint by types</th>
<th>Unit of measure</th>
<th>Mangistau population</th>
<th>Adai offspring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pulp</td>
<td>bone</td>
<td>pulp</td>
</tr>
<tr>
<td>Out of type (Kazy + zhal)</td>
<td>kg</td>
<td></td>
<td>27.4</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>16.2</td>
</tr>
<tr>
<td>I type (back, loin and hinder part of the carcass)</td>
<td>kg</td>
<td></td>
<td>81.3</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>48.2</td>
</tr>
<tr>
<td>II type (neck, humeroscapular parts, flat bone)</td>
<td>kg</td>
<td></td>
<td>56.0</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>33.2</td>
</tr>
<tr>
<td>III type (sticking piece, shank, hock)</td>
<td>kg</td>
<td></td>
<td>4.1</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>2.4</td>
</tr>
<tr>
<td>Total in carcass</td>
<td>kg</td>
<td></td>
<td>168.8</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

From the data of table 2, it can be seen that the morphological composition of the carcass of both groups was not identical. The yield of pulp in the carcasses of the Mangystau population was 5.6 kg higher (25.7 %) compared with the Adai offspring. The highest yield of pulp in both groups is observed in type I – 48.2-48.9 %, then in type II – 33.2-35.0 % and out of type – 16.2-13.7 %. The smallest volume of pulp was in type III – 2.4 %. The largest number of bones in both groups is contained in type II – 46.4-44.7 %, then in type I – 34.8-36.4 %, in type III – 14.7-14.4 % and the lowest bone content is contained in the cut out of type – 4.1-4.5 %.

Thus, more pulp was obtained from the colts of the Mangystau population, and therefore more valuable in typical proportion from the point of view of the consumer.

When studying the dairy productivity of both groups of mares, it was found that mares of the Adai offspring have higher dairy productivity than the Mangystau population under pasture conditions. Over 105 days of lactation, the milking capacity of the mares of the Adai offspring was 1617.0 liters, in the Mangystau population it was 1413.3 liters, and commercial milk yield was 674.1 and 590.1 liters, respectively. Thus, the yield of the Adai mares exceeds by 14.2 % or 84.0 liters in comparison with the Mangystau population.

The milking capacity of the mares of both groups during the 105 days of lactation was far from equal (table 3).

The mares showed higher productivity in the 2-3 months of lactation, then the milk yield gradually decreased, and more sharply towards the end of lactation. So, for example, in the 2nd month of lactation,
the milk yield of both groups of mares was 427.18 and 485.10 L, in the 3rd month 432.50 - 518.95 L, in the fourth month – 421.53-476.16 L, and the fifth month – 132.12-136.79 liters.

These scientific results are consistent with previous studies of horse breeders [7; 8; 9; 10, 11, 12], who believe that a maximum of mare's milk is secreted in the 2-3 months of lactation. With the onset of pregnancy, milk yield decreases, especially with its second half.

The indicator of the uniformity of milk secretion in mares of both groups is the average daily milk yield. Thus, the highest average daily milk yields were in the 2nd month of lactation – 13.78-15.65 L, the 3rd month – 14.42-17.30 L, and the last 5 month of lactation – 10.16-10.52 L. These data indicate that the yield curve in mares of both groups is uniform, a tendency to its decline is observed gradually.

<table>
<thead>
<tr>
<th>Milk indicators</th>
<th>Month of lactation</th>
<th>Mangistau population (n = 15)</th>
<th>Adai offspring (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per day</td>
<td></td>
<td>13.78 ± 0.26</td>
<td>15.65 ± 0.29</td>
</tr>
<tr>
<td>Per month</td>
<td></td>
<td>427.18 ± 5.74</td>
<td>485.10 ± 4.08</td>
</tr>
</tbody>
</table>

Thus, during seasonal milking of mares at Taushyk LLP, through the selection of mares from the Adai offspring of meat and milk production direction, the dairy productivity of milking mares can be significantly increased rather than the Mangistau population of the meat production direction.

The economic efficiency of growing foals of the Mangistau population and the Adai offspring of the Kazakh horses under 30 months of age was determined by the difference in all costs and revenue of the products (table 4).

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Unit of measures</th>
<th>Mangistau population</th>
<th>Adai offspring</th>
</tr>
</thead>
<tbody>
<tr>
<td>The prime cost of a newborn foal</td>
<td>tenge</td>
<td>26962</td>
<td>26962</td>
</tr>
<tr>
<td>Costs for foal growing up to 2.5 years</td>
<td>tenge</td>
<td>45062</td>
<td>45062</td>
</tr>
<tr>
<td>Live weight of 1 2.5-year-old foal</td>
<td>kg</td>
<td>359</td>
<td>350</td>
</tr>
<tr>
<td>Price per 1 kg of live weight</td>
<td>tenge</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Revenues from sales</td>
<td>tenge</td>
<td>125650</td>
<td>125200</td>
</tr>
<tr>
<td>Profit</td>
<td>tenge</td>
<td>53625</td>
<td>50476</td>
</tr>
<tr>
<td>Profitability</td>
<td>%</td>
<td>74.4</td>
<td>70.1</td>
</tr>
</tbody>
</table>

In Taushyk LLP, the cost of a newborn foal was the sum of the expenditures gone to the maintenance of the main herd (stallions – producers, mares). In 2018, a total of 1,127,000 tenge was incurred. Of these, the wages of 2 herdsmen - 720000 KZT, the cost of insurance of forage reserves – 387000 KZT and the cost of fuel – 200000 KZT. Based on this, 11.27 million KZT divided by 418 foals received this year equals 26,962 KZT. This is the prime cost of one newborn foal. 45062 tenge were spent on growing it up to 2.5 years of age. Thus, the cost of one foal at the age of 2.5 years was 72024 tenge. The wholesale purchase price of 1 kg of live weight in the Mangistau region was 350 tenge. When selling stallions for meat, the following results were obtained. Under the same conditions and costs of growing, the revenue for the Mangistau population was 125,650 tenge, and for the Adai offspring – 125,200 tenge. Profit amounted to 53625 and 50476 KZT, respectively, and profitability amounted to 74.4 and 70.1 %.

The main economic indicators of koumiss production from mares of the Mangistau population and the Adai offspring of the Kazakh horses are shown in table 5.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unit of measures</th>
<th>Mangistau population</th>
<th>Adai offspring</th>
</tr>
</thead>
<tbody>
<tr>
<td>The prime cost of 1 liter of koumiss</td>
<td>tenge</td>
<td>395</td>
<td>385</td>
</tr>
<tr>
<td>Net income</td>
<td>tenge</td>
<td>55 and 65</td>
<td>55 and 65</td>
</tr>
<tr>
<td>Profitability</td>
<td>%</td>
<td>13.9 and 16.9 %</td>
<td></td>
</tr>
</tbody>
</table>
Table 5 – Economic indicators of koumiss production in Taushyk LLP

<table>
<thead>
<tr>
<th>No</th>
<th>Indicators</th>
<th>Mangistau population</th>
<th>Adai offsprings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The number of milking mares, animals</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>The duration of the koumiss season, days</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>3</td>
<td>Total costs, tenge of them:</td>
<td>3 500 000</td>
<td>3 500 000</td>
</tr>
<tr>
<td>A)</td>
<td>Wages, tenge</td>
<td>3 385 825</td>
<td>3 782 990</td>
</tr>
<tr>
<td>B)</td>
<td>Fuel and lubricants expenses, tenge</td>
<td>100 000</td>
<td>100 000</td>
</tr>
<tr>
<td>C)</td>
<td>Concentrated feed, tenge</td>
<td>14 175</td>
<td>17 010</td>
</tr>
<tr>
<td>4</td>
<td>Milk yield per one animal, liters</td>
<td>590</td>
<td>674</td>
</tr>
<tr>
<td>5</td>
<td>Gross koumiss production, liters</td>
<td>8 850</td>
<td>10 110</td>
</tr>
<tr>
<td>6</td>
<td>The prime cost of 1 liter of koumiss, tenge</td>
<td>395</td>
<td>385</td>
</tr>
<tr>
<td>7</td>
<td>Revenue from the sale of 1 liter of koumiss, tenge</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>8</td>
<td>Profit, tenge</td>
<td>55</td>
<td>65</td>
</tr>
<tr>
<td>9</td>
<td>Profitability, %</td>
<td>13.9</td>
<td>16.9</td>
</tr>
</tbody>
</table>

Thus, raising horses of the Mangistau population and the Adai offspring in the Taushyk farm for meat and koumiss production is highly profitable and has a significant effect on increasing the production of horse meat and koumiss.
Кос топтагы биелердін сүттін бөлүнү керсететі - орташа тәулігі сауу мәліметтері. Мәліметтер үшін бір бөлік кез келген әр өкілдік жұмыс қалпына келіп, әлес сүйкіліп екесі асқада.

Осы әрекет, ЖШС «Таушық» шаруашылығында бие сауым мерзімінде етпейтін биелердің сүрлі мақсаты, бөлім соответствии мәліметтері әр бөлік үшін белгілі.

Жылы әлес ендіруде рентабельді 70-74 %-ды және 13,9-16,9 %-ды құрайды.

ЖШС «Таушық» шаруашылығы Мангыстау популяциясы және Қазақ жылкысының адай тармағын өткен және құралған орта және мұнай өндіруге орта тәулік әтпейтін әсер етеді.

Түпінің сөзі: тірі салмак, құша ет, таза ет, жұмыртқа, рентабельділік.

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ЭФФЕКТИВНОСТЬ ПРОИЗВОДСТВА КОНИНЫ И КУМЫСА ОТ КАЗАХСКИХ ЛОШАДЕЙ АДАЙСКОГО ОТРОДЬЯ

Аннотация. Адайских лошадей разводят в разных почвенно-климатических зонах Прикаспийской низменности Республики Казахстан. Они способны в течение всей зимы содержаться на пастбище, добывая корм из-под снега. Поэтому в условиях полуострова Мангышлак большое значение имеет развитие мясного коневодства, а также использование кобыл для получения молочной продукции – кобыльего молока и производства кумыса.

Объект исследования. Мангистауская популяция и адайское отродье казахских лошадей хозяйства ТОО «Таушық» Мангистауской области.

Цель работы: определить экономическую эффективность производства конского мяса и кумыса в условиях пустынной зоны Мангистауской области.

Для установления мясной продуктивности мангистауской популяции и адайского отродья казахских лошадей на убойном пункте ТОО «Таушық» был проведен убой 2,5 летних жеребчиков после осеннего нагула. Для контрольных убоев отбирались лошади, характерные для каждой популяции и отродья с близким показателям живой массы к средним данным.

Установлено, что по массе туши жеребчики адайского отродья уступали аналогам мангистауской популяции на 8,6 кг. Показатель убойного выхода у адайского молодняка был также сравнительно ниже, чем у жеребчиков мангистауской популяции и в среднем составил 53,9 %, тогда как у лошадей мангистауской популяции убойный выход равнялся 55,1%.

При изучении морфологического состава в каждом сорте и в целом по туше определялись соотношение мякоти и костей. Установлено, что выход мякоти в туших мангистауской популяции был выше на 5,6 кг (25,7 %) в сравнении с адайским отродьем. Наибольший выход мякоти в обоих группах лошадей наблюдается I сорте 48,2 – 48,9 %, затем во II сорте 33,2 – 35,0 % и вне сорта 16,2 – 13,7 %. Наименьшее количество мякоти было в III сорте 2,4 %. Наибольшее количество костей в обеих группах содержится во II сорте 46,4 – 44,7%, затем в I сорте 34,8 – 36,4%, в III сорте 14,7 – 14,4% и наименьшее содержание костей содержится в отрубе вне сорта 4,1 – 4,5 %.

Таким образом, от жеребчиков мангистауской популяции получено мякоти больше, а, следовательно, и более ценное в сортовом соотношении с точки зрения потребителя.

При изучении молочной продуктивности обеих групп кобыл установлено, что более высокой молочной продуктивностью при пастбищных условиях содержания обладают кобылы адайского отродья, нежели мангистауской популяции. За 105 дней лактации молочность кобыл адайского отродья составляла 1617,0 л, мангистауской популяции – 1413,3 л, а товарный удой составил соответственно 674,1 и 590,1 л. Таким образом, удой кобыл адайского отродья превышает на 14,2% или 84,0 л в сравнении с мангистауской популяцией.

Более высокую продуктивность кобылы показали на 2 – 3 месяце лактации, затем удой постепенно снижался, причем более резко к концу лактации. Так, например, на 2-ом месяце лактации молочность обеих групп кобыл составила 427,18 и 485,10 л, на 3 месяце 432, 50 – 518, 95 л, четвертом – 421,53 – 476,16 л и на пятом 132,12 – 136,79 л.

Показателем равномерности выделения молока у кобыл обеих групп являются данные среднесуточных удоев. Так, наибольшие среднесуточные удои были во 2 месяце лактации 13,78 – 15,65 л, 3 месяце – 14,42 –
17,30 л, а на последнем 5 месяце лактации – 10,16 – 10,52 л. Эти данные свидетельствуют о том, что кривая удоев у кобыл обеих групп равномерна, тенденция к ее спаду наблюдается постепенно.

Таким образом, при сезонном доении кобыл в ТОО «Таушык» за счет отбора кобыл адайского отрода мясо-молочного направления продуктивности нежели мангистауской популяции мясного направления продуктивности можно значительно повысить молочную продуктивность дойных кобыл.

Рентабельность при производстве конины достигает от 70% до 74 % и кумыса 13,9 – 16,9 %.

Таким образом, выращивание лошадей мангистауской популяции и адайского отрода в хозяйстве «Таушык» на мясо и производства кумыса является высокорентабельным и оказывает существенное влияние на повышение производства конины и кумыса.

Ключевые слова: живая масса, туша, мякоть, кости, лактация, себестоимость, рентабельность.

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