

## Economical Analysis of Ablactation of Eastern Anatolian Red (EAR) Calves in Different Periods

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### Abstract

In this research, economic analysis of ablactation of Eastern Anatolian Red calves in different periods was made under the conditions of Firat University Research and Implementation Farm. In the research a total of 21 pedigree Eastern Anatolian Red Calves were used in three different groups, each group included 7 calves. The calves ablactated in the 5<sup>th</sup> month and used as control group consisted the 1<sup>st</sup> group, the calves ablactated in the 4<sup>th</sup> month consisted the 2<sup>nd</sup> group and those ablactated in the 2<sup>nd</sup> month consisted the 3<sup>rd</sup> group. In formation of each group, it was paid attention that calves with the closest birth weights and birth dates were selected. When live weights of groups in day 180 were examined in the research, it was determined that the live weight value of the 1<sup>st</sup> Group was 86.07 kg, that of the 2<sup>nd</sup> Group was 99.93 kg and that of the 3<sup>rd</sup> Group was 86.93 kg. To make an economical conclusion, total milk and feed cost was found for 1 kg of live weight gain and this cost was determined as 632.08 TRY for the 1<sup>st</sup> group, 716.27 TRY for the 2<sup>nd</sup> group and 920.89 TRY for the 3<sup>rd</sup> group. As a result, it was determined that the ablactation time in which consumed milk and feed amount is most economic for both live weight increase and 1 kg live weight gain is 120 days.

**Keywords:** Calf, Eastern Anatolian Red, Economic Analysis, Ablactation, Milk.

### Introduction

In Turkey, leading source of income for cattle raising companies is milk incomes. Then calve, steers and adult animal sales follow this source (2). In a milk cattle herd, calve raising is the most detailed part of maintenance and operation required most attention. Milk is an obligatory and important nutrition for calves in the first 21 days of their lives for their normal nourishment. Then they might be nourished partially or completely by grass or early ablactation rations (calve feeding feed) (6). The amount of milk given to calves after birth, ablactation age, quality of rough feed given, properties of calf starter feed and weight increase of given amounts influence their weight gain and development considerably (3). Also, feeding type of calves after ablactation and given amounts influence their body weight and development considerably (1).

Dominant cattle race of Eastern Anatolian Region is Eastern Anatolian Red (EAR) and the calves are tried to be raised without being given any supplementary feed after they suck the milk of their mothers for a long time without control. Calve losses increase and production of animal and animal products cannot reach the desired level due to insufficient and imbalanced maintenance-nutrition.

With this research, economical analysis of ablactation of Eastern Anatolian Red race calves, which occupy an utterly important place in Turkish stockbreeding, in different periods was made and the healthiest, balanced and profitable feeding type was tried to be determined.

### Material and Methods

This research was carried out in Firat University Education, Research and Implementation Farm. Animal material in the research was as procured from Eastern Anatolian Red (EAR) calves born in Firat University Education, Research and Implementation Farm between February-April 1997. 21 EAR calves were used in the research, 8 of those were female and 13 were male.

As mix (concentrate) feed material, calve raising feed prepared in Firat University Education Research and Implementation Farm the compound of which is given in Table 1 is used. Rough feed needs of the animals in research were met using dry clover produced in Firat University Education, Research and Implementation Farm. Mother milk obtained from the mothers of calves used as milk material in the research. Analyses of feeds were made in Firat University, Faculty of Veterinary Science, Animal Feeding Diseases Department.

In the research, mothers whose deliveries were close were followed and taken into previously prepared delivery rooms two days before the delivery. Calve births happened between February and April of 1997. To protect the new born calves from negative effects resulting from low temperature of the environment, calves are taken into free movement barns with heating installation. Starting from the day they left their mothers, calves sucked the milk of their mothers naturally twice a day, in the mornings and evenings.

For research, 3 random groups including 7 calves were formed of the 21 animals the weights and birth dates of which were the closest. 1<sup>st</sup> group spent the first 5 months after their birth with their mothers and for 5 months of milk sucking period, they were fed with some mix and rough feed. Mothers of calves were dried in the 5-month period due to low condition. Calves spent 6 months of research duration near their mothers with feed they were given. 2<sup>nd</sup> group shared the same environment with animals of the 1<sup>st</sup> group by sucking their mothers for 4 months and receiving some mix and rough feed. This group was ablated in 4 months and completed the remaining 2 months of 6 months with unlimited (ad-libitum) specially prepared calve raising feed and dry clovers. The 3<sup>rd</sup> group was ablated in 2 months and they completed 6 months of research with unlimited (ad-libitum) calves start up feed and dry clovers. Calves were weighted in the first day after their birth and birth weights were determined. Weighing was made every 15 days for 6 months, 12 times in total. Data regarding given milk amount, mix and rough feed and 15-day weightings were obtained by being corrected according to the interpolation method.

To be used in economic analysis, prices of milk and feed consumed until day 180 for each group was followed regularly and recorded. As group feeding was performed in this research, only milk, rough feed (dry clovers) and mix feed (calve start up feed) were included in the cost entries. In determination of milk prices, an average price was determined considering the milk prices in the conclusion of research of the farm in which the research was conducted, private milk factory in the region, animal stock exchange and market. Determination of rough feed and mix feed prices was made by determining the average of prices taken from 7 private feed factories in the region borders, stock market and the farm in which the research was conducted.

As group feeding was made in the research, statistical evaluation wasn't conducted on feed consumption and benefit from feed and milk consumption and benefit from milk. In the comparison of animals which are included in only three groups in estimations regarding economical analysis in terms of birth and 180<sup>th</sup> day live weights and daily average weight increase, variance analysis was used and Duncan test is used in control of difference among groups.

## Results and Discussion

In the research, birth weights (day 0), 180<sup>th</sup> day live weights and daily average live weight increases (kg) of calve groups are given in Table 2. When data regarding live weight increases in all three groups are evaluated, it is seen that birth weight, 180<sup>th</sup> day live weight and daily average weight increase of the 2<sup>nd</sup> group was higher than those of the 1<sup>st</sup> and the 3<sup>rd</sup> groups and the difference among groups is statistically important ( $P < 0.05$ )

In the research, milk, mix feed and rough feed amount (kg) consumed by the groups in different periods is given in Table 3. Through the period, the 1<sup>st</sup> group was the one which consumed the highest amount of milk and lowest amount of mix and rough feed compared to 2<sup>nd</sup> and 3<sup>rd</sup> groups (Table 3).

Costs of milk and feed consumed by groups are given in Table 4. Milk costs in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> groups are 14.850 TRY, 11.962.5 TRY and 5.362.5 TRY, mix feed costs are 22.072.239 TRY, 35.495.412 TRY and 46.631.928 TRY respectively. Costs of rough feed consumed by all three groups are 14.700 TRY, 15.435 TRY and 16.023 TRY respectively (Table 4).

Total milk and feed expense (TRY) realized for 1 kg live weight gain is given in Table 5. Total costs for live weight increase for all three groups are determined as 51.622,239 TRY, 62.892.412 TRY and 68.017.428 TRY respectively. In terms of these values, the highest live weigh gain was obtained in 2<sup>nd</sup> group and total milk and feed cost for 1 kg live weight gain was the lowest in the 2<sup>nd</sup> group. Gaining the highest live weight increase with the lowest cost made the 2<sup>nd</sup> group more economic than the other two groups (Table 5).

Averages of birth weights of calves in this research were determined as 14.6 kg, 16,43 kg and 13.07 kg in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> groups respectively. As a result of statistical analysis made in terms of birth weights among groups, it was seen that the birth weight averages between the 1<sup>st</sup> and 3<sup>rd</sup> calve groups were not important, however, the birth weight average of 2<sup>nd</sup> group calves was different than the 1<sup>st</sup> and 3<sup>rd</sup> groups and this difference was statistically important ( $P < 0.05$ ). Values in research by Leibholz (5) and these values are similar in this respect. Results obtained in a research made by Winter in 1985 (7) and results of this research showed similarities in terms of feed and live weight gains of 3<sup>rd</sup> group calves were limited compared to the consumed feed. In this research, 1<sup>st</sup> and 3<sup>rd</sup> groups showed a lower performance than the 2<sup>nd</sup> group calves in terms of live weight increase. Performance lowness of 1<sup>st</sup> group calves can be related to the fact that they sucked fatty milk for 5 months, thus milk fat affected digestion of 1<sup>st</sup> group calves in a negative way. Lowness of weight gain of 3<sup>rd</sup> group calves can be related to the fact that the digestive system of calves couldn't fully digest the calve start up feed. Therefore, lowness daily live weight increase in this period reflected on weight gain of 3<sup>rd</sup> group calves during research. In this research, when consumption amount of milk and feed by calve groups is looked at, 3<sup>rd</sup> group of calves is the group consuming the highest amount of mix and rough feed as they were ablated in the 2<sup>nd</sup> month. In addition, the highest milk consumption was in the 1<sup>st</sup> group. These results in research showed similarities with the results in study conducted by Economides and Georghades (4). Milk replacement feed used instead of milk found its right target. Gained live weight amounts reached the top level especially in the period

they were ablated and continued to be given milk replacement feed. As milk replacement feed use was performed with a lower cost in terms of feeding costs, it was an indicator of good profit in economical terms. Consumed milk and feed amounts in this research were found as 51.622.239 TRY, 62.892.412 TRY and 68017428 TRY in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> groups respectively. When live weights reached in 180<sup>th</sup> day, first group reached the weight of 86.07 kg, 2<sup>nd</sup> group reached the weight of 99.93 kg and 3<sup>rd</sup> group reached the weight of 86.93 kg. In terms of live weight, 2<sup>nd</sup> group gained the most profitable result in economical terms. Total milk and feed cost for 1 kg of live weight was reflected in the study, this cost are found as 716.279 TRY for the 1<sup>st</sup> group, 632.084 TRY for the 2<sup>nd</sup> group and 920.896 TRY for the 3<sup>rd</sup> group. According to this data, the most profitable result in terms of cost was obtained by the 2<sup>nd</sup> group.

Table 1..Contents of The Calves Growing Ration(%)

Fish Meal	Soybean Meal	Barley	Marble.Powder	Salt	Vitamin+ Eshential Mineral
01.50 (%)	26.34 (%)	69.03 (%)	02.30 (%)	00.53 (%)	00.30 (%)

Table 2..The Live weight Means and Their Standart Error of The Means by Different Feding Stage Day (x ± Sx)

Groups	n	(Birth Weight) (kg)	Day180th Weight	Average Daily Gain Weight (kg)
Group I	7	14.00 ± 0.27a	86.07 ± 3.59 a	0.400 ± 0.02 a
Group II	7	16.43±0.97b	99.93±3.18b	0.463±0.02b
GroupIII	7	13.07±0.23a	86.93±2.44a	0.410±0.01a
F		8.428*	13.651 *	6.022*

a.b : some letters in the same colums are significant by the means of groups. \*: P< 0.05.

Table 3. The Dairy Cattle Feed, Compound Feed and Rough age Intake Amounts by The Different Stage of Feeding for Groups ( Kg)

Groups	n	The Amount of Food Consumed Milk	0-30 Days	30-60 Days	60-90 Days	90-120 Days	120-150 Days	150-180 Days	Owerall
Group I	7	Milk (kg)	64.28	90.00	90.00	90.00	90.00	90.00	424.28
		Compound Feed (kg)	-	1.50	7.50	13.50	25.50	51.00	99.00
		Roughage Feed (kg)	1.50	4.50	10.50	22.50	37.50	61.50	138.0
Group II	7	Milk(kg)	72.85	90.00	90.00	90.00	-	-	342.85
		Compound Feed(kg)	-	1.95	7.50	14.40	48.00	82.00	154.00
		Roughage Feed(kg)	1.50	4.50	10.50	24.00	48.00	69.00	157.00
Group III	7	Milk (kg)	62.14	90.00	-	-	-	-	152.14
		Compound Feed(kg)	-	1.80	24.00	42.00	55.50	81.50	204.30
		Roughage Feed(kg)	1.50	4.50	21.00	34.50	48.00	61.50	171.50

Tablo 4. Feed Costs of Dairy Cattle Feed, Compound Feed and Rough age at The Different Feeding Stage by Groups (TL)

Groups	n	The Amount of Food Consumed Milk	0-30 Days	30-60 Days	60-90 Days	90-120 Days	120-150 Days	150-180 Days	Owerall
Group I	7	Milk (kg)	2.249.975	3.150	3.150	3.150	3.150	-	14.850
		Compound Feed (kg)	-	189.777	1.432.830	2.768.850	5.704.860	11.975.922	22.072.239
		Roughage Feed (kg)	147	441	1.470	2.940	3.675	6.027	14.700
Group II	7	Milk(kg)	2.549.995	3.150	3.150	3.150	-	-	11.962.5
		Compound Feed(kg)	-	1.138.661	1.432.830	2.953.440	10.738.560	19.231.921	35.495.412
		Roughage Feed(kg)	147	441	1.029	2.352	4.704	6.762	15.435
Group III	7	Milk (kg)	2.174.970	3.150	-	-	-	-	5.362.5
		Compound Feed(kg)	-	3.415.986	4.585.056	7.193	12.416.460	19.020.582	46.631.928
		Roughage Feed(kg)	147	441	2.058	2.646	4.704	6.027	16.023

Tablo 5 Total Cost of Milk and Feed for Gaining 1 Kg Live weight Per Day (TL)

Groups	n	Gaining Live weight(kg)	Milk Cost	Cost of Compaund	Cost of Roughage	Owerall	Average of Cost of Daily Feed	Total Cost of Milk and Feed for Amount of Gaining 1 kg Live weight Per Day
Group I	7	72.07	14.850	2.2072,2	14.700	51.622.2	286,7	716,27
GroupII	7	99.50	11.962.5	35.495,4	15.435	62.892,4	349,4	632,08
Group III	7	73.86	5.362.5	46.631,9	16.023	68.017,4	377,8	920,89

### Conclusions

Consequently, in this research; ablactation was made in 2, 4 and 5 months old calves and economical analysis of ablactation in different times was examined. Statistical analyses in the research showed that the highest weight gain in terms of live weight increase was realized by the 2<sup>nd</sup> group which was ablactated in the 4<sup>th</sup> month. The group in which total cost of consumed milk and feed for 1 kg live weight was lowest yet gained live weight was higher was the 2<sup>nd</sup> group. This situation showed us feeding with milk replacement feed instead of milk may reduce the cost and be a reason for preference. Issues regarding the animal material used in stock breeding sector constitute the most important factors affecting the cost. Important hereditary characteristics in cattle such as live weight gain and ability to benefit from feed stand out. The animal gaining 1 kg live weight with the least feed is the economical one. We can suggest that under the circumstances of region, effective ablactation time of EAR (Eastern Anatolian Red) calves, which has influences on their growth period is 120 days and feeding with replacement feed replacing milk after this period yields the most economical solution.

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