Journal of Livestock Science and Technologies, 2017, 5 (1): 51-58 http://lst.uk.ac.ir
DOI: 10.22103/jlst.2017.1652

Determination of economic values for some important traits of Rayeni cashmere goats reared under pasture system

N. Kargar Borzi[1,2*], A. Ayatollahi Mehrgardi [1], M. Vatankhah[3] and M. Asadi Fozi[1]

[1]Department of Animal Science, Faculty of Agriculture, Shahid Bahonar University of Kerman, Kerman, Iran.
[2]Animal Science Research Department, Kerman Agricultural and Natural Resources Research and Education Center, AREEO, Kerman, Iran.
[3]Animal Science Research Department, Chaharmahal and Bakhtiari Agricultural and Natural Resources Research and Education Center, AREEO, Shahrekord, Iran.
*Corresponding author, E-mail address: najmehkargar@agr.uk.ac.ir

Abstract Rayeni Cashmere goat is one of the most important goat breeds in Iran, nevertheless, the production rate and consequently the financial income are not satisfactory at the moment. This necessitates to investigate various features of the production chain, such as costs and revenues of the system. Hence, in this study a deterministic bio-economic model was used to estimate the economic values for reproductive traits (conception rate, twining rate and litter size), production traits (body weight of kid sold at 6.5 months, annual cashmere weight, doe body weight and annual milk yield) and longevity (doe survival , survival of kid until weaning and survival of kid until sale age at 6.5 months), using data on 10 Rayeni Cashmere goat flocks including 1810 does and 95 bucks in Kerman province, south-east of Iran. Sensitivity analysis of economic values to price levels of input and output was also carried out. Revenue sources of production system included: live weight, milk and cashmere production, while live weight was the most important one and included 62.37% of the total revenues. Total profit was US $ 126.2 per doe per year. The most important trait was annual milk yield followed by the litter size with the relative importance of 0.99 and 0.016, respectively. The least economically important trait was the doe body weight (-0.040). In this system, all economic values were positive except that for the doe body weight. Changes in prices of input and output had a small effect on economic values.

Keywords: Rayeni cashmere goats, economic value, pasture system

Received: 07 Oct. 2016, *accepted:* 27 May. 2017, *published online:* 08 Jun. 2017

Introduction

There are about one billion goats in the world, 22 million heads of which (2.2%) are in Iran (FAOSTAT, 2014). The Rayeni cashmere goat is an important Iranian goat breeds mostly reared in the city of Baft in Kerman province. These animals usually live in high, cold mountainous regions and are known as one the most pure cashmere goats mass in the country (Baghizadeh et al., 2009). They are kept for both meat and cashmere production (Moghadaszadeh et al., 2015).

There is a necessity to study various aspects of the production chain, including costs and revenues of the system by increasing demand for goat production (Kosgey et al., 2003). A well-defined breeding objective is the first necessity of any genetic improvement program. Breeding objectives contain those traits, which one attempts to improve genetically because they influence returns and costs to the breeder (Kahi and Nitter, 2003). The economic value for any trait is estimated as the amount of change in the profit of the system as its mean increases by one unit, while the means of other traits are constant (Kosgey et al., 2004; Fuerst-Waltl and Baumung, 2009). The bio-economic model is useful for estimating economic values for traits and provides a very strong tool to estimating the economic value of genetic changes in the trait, and studying the robustness of these values in response to changes in nutrition, management and market prices (Kosgey et al., 2003).

The breeding goals for livestock species consist of production and functional traits. Notable breeding objectives have been defined for various livestock species in different countries, e.g. for Moghani sheep (Abdollahy et al., 2012), indigenous chicken (Okeno et al., 2012), Creole goats (Gunia et al., 2012) and Aberdeen Angus cattle (Campos et al., 2014) but are lacking for

Rayeni cashmere goats.

The present study aimed at developing breeding objectives by estimating the economic values for several traits for Rayeni cashmere goats in a semiarid region of Kerman province, reared under small holder farming conditions and feeding on native pastures.

Materials and methods

Model description and definitions

A deterministic static model (Kosgey et al., 2003) which assumes no variation in specifications among animals was used to calculate the economic values (EVs) of important traits in Rayeni cashmere goats. The total annual profit of a flock was calculated as the difference between costs and revenues of the system. The average prices in 2014 were used and all costs and prices were expressed in US dollar ($). The productive unit was the doe, and the time unit was one year. Costs included the feed, management and fixed costs. Revenues were derived from the sale of culled does and bucks, excess kids, cashmere and milk. The input variables of the model are described in Table 1. The surrounding areas of the Baft city in Kerman province were chosen for collecting the necessary information, as this area is the main Rayeni cashmere goat production region in Iran. A comprehensive survey was done. The criterion to select the flocks was interest to implement a breeding pro gram and herd size. Ten farmers agreed to cooperate in this study. The input parameters were derived from ten herds with a total population of 1905 heads. Seasonal variations in performance and price were not included in the model.

Three components were considered for health care including: general drugs and veterinary services, control of parasitic diseases and vaccination. Supply of labor by the farmer was set to be fixed per animal per year but varied with the size of the flock. It was considered to be the same for all animals except for replacement bucks that were considered to require half the amount of labor per animal. The replacement buck was less cared for than the young buck and the breeding animals. Products such as excess kids and culled live animals were sold. Raw milk was not sold while milk products such as yogurt, cheese, butter and fat were sold. The goats in Baft city are fed almost entirely on the native pasture. At the end of autumn most farmers migrate to warmer areas in provinces adjacent to the Persian Gulf. During the drought periods and low feed availability, purchased roughages and barley grain are fed to the goats. The kids are fed with milk during the first 6 weeks of life.

Animal flows and events

The animal flows and events of a flock are shown in

Table 1. Flock structure, and economic, management and production information of Rayeni cashmere goats

Variable	Value	Variable	Value
Flock structure		Management variables	
Number of doe in flocks	1810	Weaning age of kids (months)	4.5
Number of buck in flocks	95	Age of kids sold (months)	6.5
Conception rate (%)	90	Age of selection replacement (months)	8
Twining rate (%)	11	Age at first mating (months)	18
Litter size	1.11	Age at mature weight (months)	18
Doe survival (%)	94	Age at culling of does (year)	6
Replacement survival (%)	91	Age at culling of bucks (year)	4
Pre-weaning survival (%)	90	Proportion of bucks in flock (%)	5
Post-weaning survival (%)	95	Economic variables(US $)	
Replacement rate (%)	30	Cashmere price ($/kg)	20
Culling rate of does (%)	21	Milk price ($/kg)	2.833
Culling rate of bucks (%)	2	Price of live kid ($/kg)	5
Production variables		Price of live culling goat ($/kg)	3.667
Birth weight (kg)	3.8	Cost of feeding of doe ($/kg)	0.447
Weaning weight (kg)	18	Cost of feeding of kid sold ($/kg)	0.289
Mature weight of bucks (kg)	48	Cost of milk production ($/kg)	0.118
Mature weight of does (kg)	36	Cost of cashmere production ($/kg)	0.237
Weight of kids sold (kg)	20	Fixed costs ($)	0.9
Weight of kids yearling (kg)	29	Labor ($/ head)	18.67
Milk weight in year (kg)	27	Keeping ($/ head)	0.533
Cashmere weight in year (g)	550	Health care ($/ head)	0.743

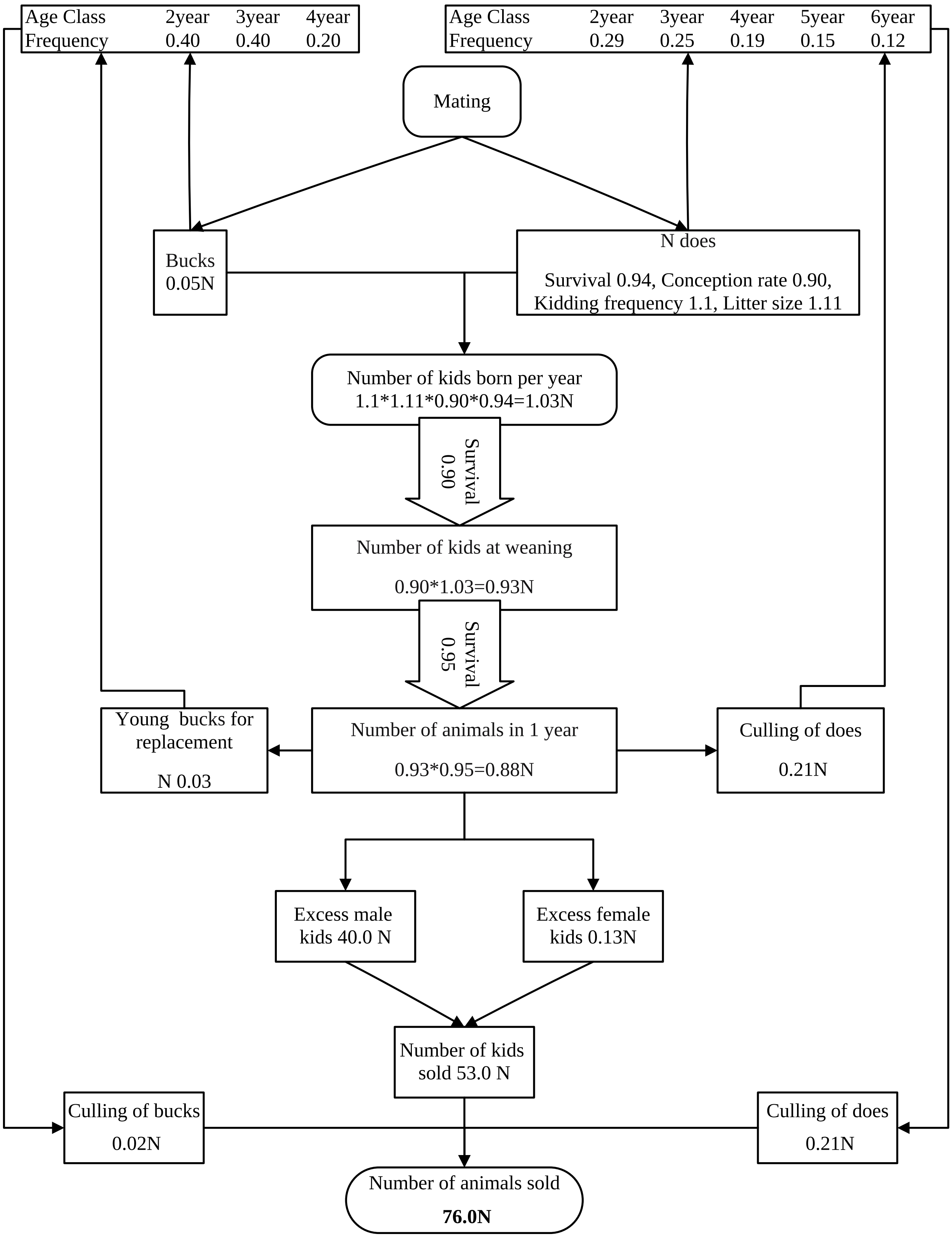

Figure 1. Flock dynamics for Rayeni cashmere goat

Figure 1.

A fixed number of breeding does (N) were assumed to be present in the flocks over the entire period. Based on the animal ages, 9 categories were considered, including: (1) born kid (0–4 months old); (2) weaning kid (4–6 months old); (3) up to yearling kid (6–12 months old); (4) replacement of female (12–18 months old); (5) replacement of male (12 months old); (6) breeding doe (>18 months old); (7) breeding buck (>12 months old); (8) culled doe (>6 years old); (9) culled buck (>4 years old).

It was assumed that 50% of kids born were males. Males not required for breeding were sold, and the breeding males were culled after four productive years. The breeding season for Rayeni cashmere goat extended from the end of July to the end of September, with a twinning rate of 11% and conception rate of 90%. This figure was on 12-month basis and production system was based on single bearing at one year. In this system, the suckling kids are weaned at 4.5 months of age, with a pre-weaning mortality rate of 10%, and the post-weaning kid mortality (5 to 12 months after weaning) of 5%. The mortality rate of replacements was 9% up to 18 months of age. The annual mortality rate of the breeding does was calculated as 6% and it was assumed to be distributed equally for the entire period.

Profit equations

Total annual profitability of the goat flock (TP) was described by equation 1(Kosgey et al., 2003):

$$TP = [N \times (R - C)] \quad (1)$$

where N is the number of does in the flock per year, R is the average revenue, per doe per year and C is the average costs, per doe per year. The revenue (R) was calculated from equation 2, as the sum of four revenues (Kosgey et al., 2003):

R = excess kids meat + culled does and bucks meat + cashmere + milk (2)

R= (doe survival × conception rate × number of kid per year) × [(twining rate × pre-weaning survival × post-weaning survival × weight of kids sold × price of live kid) + (annual cashmere weight × cashmere price) + (annual milk yield × milk price)] – (replacement rate × weight of kids sold × price of live kid) + (culling rate of doe ×mature weight of doe × price of live culled goat) + (culling rate of buck ×mature weight of buck ×price of live culled goat)

The costs (C) were calculated from equation 3, as the sum of five items (Kosgey et al., 2003):

C = feed + labor + keeping + health care + fixed costs (3)

C_{feed} = (doe survival × conception rate × number of kid per year) × [(twining rate × pre-weaning survival × post-weaning survival × weight of kids sold × cost of feeding of kid sold) + (annual cashmere weight × cost of cashmere production) + (annual milk yield × cost of milk production)] + (mature weight of doe × cost of feeding of doe) + proportion of bucks in flock × (mature weight of buck × cost of feeding of doe)

Derivation of economic values (EVs)

The economic value for a trait is defined as the change in the flock profit resulting from a unit change in that trait, assuming all other traits were constant.

The economic value of each trait was obtained by Vi = Pi − P, where P and Pi are the profits before and after increase of the trait by 1%, while all other traits were kept at their mean value (Lôbo *et al*., 2011).

The economic weight of each trait was obtained by Vi * GSDi, where Vi and GSDi are the economic value and genetic standard deviation, respectively. For comparison of the economic values of different traits, the relative importance (RI) of each trait was obtained using equation 4:

$$RI = \frac{EV_i \times GSD_i}{\sum_{i=1}^{i} |EV_i \times GSD_i|} \quad (4)$$

where EV and GSD are the economic value and genetic standard deviation of each trait, respectively (Gunia *et al*., 2012).

Changes in prices (Sensitivity analysis)

For analysis of the sensitivity of the economic values against changes in different factors; price levels of costs, live weight, milk and cashmere production were changed by ±20%, separately. The economic value for each trait was obtained under these conditions.

Results and discussion

Revenues and costs in base situation

Costs, revenues and profits of the base situation are shown in Table 2. The values are weighted by proportions of each animal category with respect to the number of does present, and the total was expressed per doe per year. For example, feed cost for 1.03 born kid was US $ 0 and meat revenue from 0.87 yearling kid was US $126.2. Feed cost per doe per year was US $ 64.55 whereas the total revenue per doe per year was US $

Table 2. Costs and revenues per proportion of animals in each category to number of does present and profit per doe per year

	Born kid	Weaning kid	Yearling kid	Replacement of female	Replacement of male	Doe	Culled doe	Buck	Culled buck	Total	Proportion to total
Proportion of animals to does	1.03	0.93	0.87	0.30	0.03	1	0.21	0.05	0.02		
Costs (C)											
Feeding	0	4.64	17.27	5.65	1.08	33.99	0	1.91	0	64.55	47.98
Labor	0.47	2.30	6.90	9.20	9.20	18.67	0	18.67	0	65.42	48.62
Health care	0.07	0.09	0.27	0.37	0.37	0.74	0	0.74	0	2.653	1.97
Maintenance	0.07	0.07	0.20	0.26	0.26	0.53	0	0.53	0	1.922	1.43
Fixed	0	0	0	0	0	0	0	0	0	0.90	0.67
Total	0.60	7.10	24.64	15.49	10.91	53.93	0	21.86	0	134.5	100
Revenues (R)											
Live weight	0	0	126.20	0	0	0	32.34	0	4.11	120.20	62.37
Milk	0	0	0	0	0	76.50	0	0	0	76.50	29.34
Cashmere	0	0	5.22	3.30	0.39	12	0	0.70	0	21.61	8.29
Total	0	0	131.40	3.30	0.39	88.50	32.34	0.70	4.11	260.8	100
Profit	-0.60	-7.10	106.70	-12.19	-10.53	34.57	32.34	-21.16	4.11	126.2	-

260.8. Born kid, weaning kid, replacement of females, replacement of males and bucks had no revenue from the sale of meat; as a result, the profit was negative. Among inputs (costs), labor cost constituted 48.62% of the total costs while feed constituted the second largest source of costs, which coincided with results of Vatankhah (2010), Bett et al. (2007) and Lôbo et al. (2011). Variable costs, 99.3% of the total costs, are due to feed and non-feed costs. Fixed costs had a limited role in this system; it was in accordance with the results derived from studies conducted by Haghdoost et al. (2008), and Abdollahy et al. (2012) on Arabic and Moghani sheep production systems, respectively. Low fixed cost reflected the traditional and small animal husbandry systems. Fixed costs varied widely between flocks, depending on the type of barn used. Traditional barns were cheap, whereas upgraded or newly built barns were expensive. Abdollahy et al. (2012) estimated the fixed costs at a proportion of 0.67%, which was in accordance with our results while Bett et al. (2007) estimated the fixed costs for smallholder medium-potential at a proportion of 1.62%, which was more than the evaluated amount in the present study.

Revenue sources included the live weight, milk and cashmere production. Live weight income was the most important source of revenue and second source being milk production with proportion of 62.37% and 29.34% of total profit, respectively; these findings are in agreement with Vatankhah (2010) and Bett et al. (2007). Among all animal categories, the highest income came from the does and yearling kids. Selling meat of excess yearlings gained higher revenue due to its high demand. Total profit was US $ 126.2 per doe per year, which increases when producers mostly use pasture for feeding because the feed costs are decreased. However, during the drought periods, feed cost is increased due to low pasture availability.

Economic values

The traits that appeared in the profit equation were reproductive traits (conception rate, twining rate and litter size), production traits (body weight of kid sold at 6.5 months, annual cashmere weight, doe body weight and annual milk yield) and longevity (doe survival, survival of kid until weaning and survival of kid until sale age at 6.5 months). Economic values, economic weights and relative importance of traits are shown in Table 3. Estimation of economic values, economic weights and relative importance for all traits was positive, except for the doe body weight. Positive economic values indicated that genetic improvement in the trait would result in positive effect on profitability. The negative economic value for adult doe body weight was in agreement with the values reported by Bett *et al.* (2011) and Vatankhah (2010). The highest economic value under the base situation was obtained for annual milk yield. Likewise, milk production showed high economic value for dairy goat system in Brazil (Lopes et al., 2012). Highest economic value reported by Bett *et al.* (2011) and Vatankhah (2010) were for the yearling live weight and doe survival, respectively. Based on the calculated economic value of the traits, for increasing flock profit more attention should be given to genetic improvement of annual milk yield, litter size, conception rate, and doe survival. Doe survival is very important in tropical areas due to high outbreak of diseases. In general, it is difficult to compare economic values among different stud-

Table 3. Estimation of economic values, economic weight and relative importance for some traits in Rayeni cashmere goats

Traits	Mean	Economic values (US $)	Economic weight (US $)	Relative importance
Reproductive traits				
Conception rate	0.90	7.610	0.335	0.009
Twining rate	0.11	3.795	0.239	0.006
Litter size	1.11	6.226	0.616	0.016
Longevity				
Doe survival	0.94	7.286	0.321	0.008
Survival of kid until weaning	0.90	0.464	0.057	0.001
Survival of kid until sale age at 6.5 months	0.94	0.444	0.055	0.001
Production traits				
Body weight of kid sold at 6.5 months	20	0.122	0.276	0.007
Doe body weight	38	-0.949	-1.746	-0.040
Annual milk yield	27	23.82	38.59	0.990
Annual cashmere weight	0.55	1.883	0.226	0.006

ies and breeds, or production systems within a study.

Sensitivity analysis

Sensitivity analysis of the economic values of the traits to various conditions also gives information on the likely direction of future genetic improvement and production system (Kosgey et al., 2003). Changes in the relative economic value against changes in some inputs and outputs are shown in Table 4. In this study, sensitivity of the economic values was proportional to ±20% changes in prices of costs, milk, cashmere and live weight, because they have the greatest effect on the profit of the system under local conditions. The economic value for traits, except for cashmere weight, increased when price of costs was reduced, and vice versa. The relative economic values of traits, except milk yield and annual cashmere weight, had the highest sensitivity to change in meat price, which was the most important component of the profit. The economic values of doe survival, twining rate, litter size and annual milk yield had the highest sensitivity to change in milk prices. Comparably, prices of output had the most effect on the economic value of traits in native black goat (Vatankhah, 2010).

Conclusions

In the present investigation, the economic values for important traits in Rayeni cashmere goats were obtained. Generally, the annual milk yield, litter size, conception rate and doe survival were the most important traits. The economic values of traits examined in this study can be used for the definition of breeding objectives and construction of selection indices for Rayeni cashmere goats.

Acknowledgments

We are grateful to the nomads that participated in the study, answered all questions and allowed us to work with them and their goats.

Table 4. Estimation of relative economic values for the traits with changes in the levels of inputs and outputs price in Rayeni cashmere goats

Traits	Mean	Base situation	Level of costs		Level of milk price		Level of cashmere price		Level of live weight price	
			-20%	+20%	-20%	+20%	-20%	+20%	-20%	+20%
Conception rate	0.90	0.009	0.010	0.008	0.009	0.009	0.009	0.009	0.005	0.012
Twining rate	0.11	0.006	0.008	0.005	0.006	0.007	0.006	0.006	0.002	0.011
Litter size	1.11	0.016	0.019	0.012	0.014	0.017	0.016	0.016	0.009	0.022
Doe survival	0.94	0.008	0.009	0.008	0.007	0.009	0.008	0.008	0.007	0.009
Survival of kid until weaning	0.90	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.003
Survival of kid until sale age at 6.5 months	0.94	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.002
Body weight of kid sold at 6.5 months	20	0.007	0.008	0.006	0.007	0.007	0.007	0.007	0.004	0.009
Doe body weight	38	-0.040	-0.038	-0.041	-0.040	-0.040	-0.040	-0.040	-0.046	-0.032
Annual milk yield	27	0.990	0.998	0.984	0.932	1.041	0.990	0.990	0.990	0.990
Annual cashmere weight	0.55	0.006	0.006	0.006	0.006	0.006	0.002	0.011	0.006	0.006

References

Abdollahy, H., Hasani, S., Zerehdaran, S., Shadparvar, A.A., Mahmoudi, B., 2012. Determination of economic values for some important traits in Moghani sheep. *Small Ruminant Research* 105, 161–169.

Baghizadeh, A., Bahaaddini, M., Mohamadabadi, M.R., Askari, N., 2009. Allelic variations in exon 2 of caprine MHC class II DRB3 gene in Raeini Cashmere goat. *American-Eurasian Journal of Agricultural and Environmental Science* 6, 454-459.

Bett, R.C., Kosgey, I.S., Bebe, B.O., Kahi, A.K., 2007. Breeding goals for the Kenya dual purpose goat. II. Estimation of economic values for production and functional traits. *Tropical Animal Health and Production* 39, 467-475.

Bett, R.C., Kosgey, I.S., Kahi, A.K., Peters, K.J., 2011. Definition of breeding objectives and optimum crossbreeding levels for goats in the smallholder production systems. *Small Ruminant Research* 96, 16–24.

Campos, G.S., Neto, B.J., Oaigen, R.P., Cardoso, F.F., Cobuci, J.A., Kern, E.L., Campos, L.T., Bertoli, C.D., McManus, C.M., 2014. Bioeconomic model and selection indices in Aberdeen Angus cattle, *Journal of Animal Breeding and Genetics* 131, 305-312.

FAOSTAT, 2014. Available at : http://www.fao.org/faostat/en/#data/QA [Verified 20 May 2014].

Fuerst-Waltl, B., Baumung, R., 2009. Economic values for performance and functional traits in dairy sheep. *Italian Journal of Animal Science* 8, 341–357.

Gunia, M., Mandonnet, N., Arquet, R., Alexandre, G., Gourdine, J.L., Naves, M., Angeon, V., Phocas,F., 2012. Economic values of body weight, reproduction and parasite resistance traits for a Creole goat breeding goal. *Animal* 7, 22-33.

Haghdoost, A., Shadparvar, A.A., Beigi Nasiri, M.T., Fayazi, J., 2008. Estimates of economic values for traits of Arabic sheep in village system. *Small Ruminant Research* 80, 91–94.

Kahi, A.K., Nitter, G., 2003. Developing breeding schemes for pasture based dairy production systems in Kenya. I. Derivation of economic values using profit functions. *Livestock Production Science* 88, 161–177.

Kosgey, I.S., van Arendonk, J.A.M., Baker, R.L., 2003. Economic values for traits of meat sheep in medium to high production potential areas of the tropics. *Small Ruminant Research* 50, 187– 202.

Kosgey, I.S., Van Arendonk, J.A.M., Baker, R.L., 2004. Economic values for traits in breeding objectives for sheep in the tropics: impact of tangible and intangible benefits. *Livestock Production Science* 88, 143–160.

Lopes, F.B., Borjas, A.R., Silva, M.C., Faco, O., Lobo, R.N., Fiorvanti, M.C.S., McManus, C., 2012. Breeding goals and selection criteria for intensive and semi-intensive dairy goat system in Brazil. *Small Ruminant Research* 106, 110–117.

Lôbo, R.N.B., Pereira, I.D.C., Facó, O. and McManus, C., 2011. Economic values for production traits of Morada Nova Meat sheep in a pasture based production system in semi-arid Brazil. *Small Ruminant Research* 96, 93-100.

Moghadaszadeh, M., Mohammadabadi, M.R., Esmailizadeh, A., 2015. Association of exon 2 of BMP15 gene with the litter size in the Raini Cashmere goat. *Genetics in the 3rd Millennium*. 13, 4062-4067.

Okeno, T.O., Magothe, T.M., Kahi, A.K., Peters, K.J., 2012. Application of risk-rated profit model functions in estimation of economic values for indigenous chicken breeding, *Tropical Animal Health and Production* 44, 1279–1287.

Vatankhah, M., 2010. Determination of economic weights for some important traits in native black goats. Final Report. Animal Sciences Research Institute. Iran.

Communicating editor: *Ali K. Esmailizadeh*

تعیین ضرایب اقتصادی برخی صفات مهم بز کرکی راینی در سامانه مرتعی

ن. کارگر برزی[1,2]* ، ا. آیت‌اللهی مهرجردی[1]، م. وطن‌خواه[3] و م. اسدی فوزی[1]

[1]بخش مهندسی علوم دامی، دانشکده کشاورزی، دانشگاه شهید باهنر کرمان، کرمان، ایران.

[2]بخش تحقیقات علوم دامی، مرکز تحقیقات و آموزش کشاورزی و منابع طبیعی استان کرمان، سازمان تحقیقات، آموزش و ترویج کشاورزی، کرمان، ایران.

[3]بخش تحقیقات علوم دامی، مرکز تحقیقات و آموزش کشاورزی و منابع طبیعی استان چهارمحال و بختیاری، سازمان تحقیقات، آموزش و ترویج کشاورزی، شهرکرد، ایران.

*نویسنده مسئول، پست الکترونیک: najmehkargar@agr.uk.ac.ir

چکیده بز کرکی راینی یکی از مهمترین نژادهای بز ایران به شمار می‌رود، با این حال، در حال حاضر میزان تولید و به تبع آن درآمد مالی حاصل از پرورش این نژاد رضایت‌بخش نیست. بررسی ویژگی‌های سیستم تولیدی شامل درآمد و هزینه‌های سیستم ضروری است، بنابراین، در این تحقیق از مدل زیست اقتصادی برای برآورد ضرایب اقتصادی صفات تولیدمثل (میزان آبستنی، تعداد بزغاله متولد شده در هر زایش و میزان دوقلوزایی)، ماندگاری (زنده‌مانی بز ماده، زنده‌مانی بزغاله تا شیرگیری و زنده‌مانی بزغاله‌ها تا فروش) و صفات تولید (وزن کرک و شیر تولیدی، وزن زمان فروش و وزن بلوغ بز ماده) حاصل از رکوردگیری تعداد ۱۰ گله شامل ۱۸۱۰ بز ماده و ۹۵ بز نر نژاد کرکی راینی در طول یک چرخه تولید سالانه در استان کرمان (شهرستان بافت) استفاده شد. آنالیز حساسیت ضرایب اقتصادی به تغییر قیمت نهاده‌ها و ستانده‌ها نیز تعیین گردید. منابع درآمد سیستم تولید شامل وزن زنده، شیر و کرک تولیدی بود که درآمد حاصل از فروش دام زنده با ۶۲/۳۷ درصد بیشترین سهم از کل درآمد را به خود اختصاص داد. سود کل واحد تولیدی ۱۲۶/۲ دلار به ازای هر رأس بز ماده در یک سال محاسبه گردید. مهم‌ترین صفات شامل وزن شیر تولیدی و تعداد بزغاله متولد شده در هر زایش به ترتیب بااهمیت نسبی ۰/۹۹ و۰/۰۱۶ بودند. کمترین ضریب اقتصادی مربوط به صفت وزن بلوغ بز ماده برآورد شد (۰/۰۴۰-). در این سیستم تولیدی همه ضرایب اقتصادی به‌جز وزن بلوغ بز ماده مثبت به دست آمد. تغییر در قیمت‌ها اثر بسیار کمی در برآورد ضرایب اقتصادی صفات داشت.