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Effect of Inbreeding on Birth, Weaning and Yearling Weights in Sohagi Sheep

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ABSTRACT

The current study was carried out to evaluate the impact of inbreeding on lamb weight at birth (BW), weaning (W90) and yearling (W360).This study used the pedigree records of 1290 Sohagi lamb progenies of 44 sires and 491 dams reared at experimental farm, Faculty of Agriculture, Sohag University from 2001 to 2021. Non-genetic factors effect on studied traits was investigated. Average of BW, W90 and W360 were 2.98±0.01, 15.05±0.07, and 32.61±0.17 kg, respectively. The results showed that 34.34% of the current dataset were inbred animals. Inbreeding coefficients of inbred animals ranged from 0.02 to 37.5%, averaging 6.57%. Inbreeding regression coefficient on birth year for overall inbreeding coefficient was -0.0003 and that for inbred animals (-0.01) was significantly negative (P<0.01). BW and W90 decreased by 0.004 and 0.002 kg for each 1% increase in the inbreeding coefficient together with an increase of 0.009 kg in W360. The results of rank correlation of Spearman between estimate breeding values (BV's) of animals obtained from adding or not adding inbreeding coefficient of lambs as a covariate term showed no changes of animals ranking. It was concluded that inbreeding showed negligible effect on studied body weight traits. Also, to reduce the level of inbreeding, increasing number and replacement of rams for mating can be a successful strategy.

Keywords: Sohagi sheep, lamb, Inbreeding depression, body weight.

INTRODUCTION

In Upper Egypt, Sohagi sheep are considered one of the sheep breeds and represents an important source of meat and wool in Sohag Governorate. Birth, weaning, and yearling weights are economically important traits in sheep. These traits are affected by many genetic and non genetic factors such asparity, sex, type of birth, season, and year of birth. Seasonal variations from year to year influence the whole flock population while the type of birth influences individual performance (Hussain *et al*., 2006). In any closed population, estimation of the inbreeding level is important for the development of genetic improvement programs (Eteqadi *et al*., 2014; Elsaid *et al*., 2018).

The inbreeding level can be calculated using pedigree, which was used to determine the inbreeding coefficient within individuals (Bannasch *et al*., 2021). The value of inbreeding represents a change in the genetic structure of population in favor of sets gene homozygosity and at the cost of the gene pool heterozygosity of individuals, and it means a loss of genetic variability that may affect negatively the fitness and performance and increase the incidence of phenotypic defects (Akhtar *et al*., 2000; Elsaid *et al*., 2018; Vostry *et al*., 2018).

Strong selection usually leads to a great genetic gain, but massive use of small numbers of animals that are genetically superior results in higher rates of inbreeding and loss of genetic variation (Spehar *et al*., 2022). Using breeding values alone that estimated from Best Linear Unbised Prediction (BLUP) leads to more closely related candidate favoring selection with increasing inbreeding levels because they share most of their familial information (Yeganehpour *et al*., 2015). Increasing the inbreeding level may result in inbreeding depression whichis the change in performance per unit of inbreeding coefficient. Inbreeding depression associated with decreased performance for many of economic traits (Drobik and Martyniuk, 2016; Yeganehpar *et al*., 2016). So sheep breeder has to maintain the rates of inbreeding at an acceptable level to obtain higher genetic gain (Elsaid *et al*., 2018; Tajada *et al*., 2020).

No studies based on level of inbreeding and its effects in Sohagi sheep were conducted. Therefore, this study was conducted to evaluate the effect of inbreeding on birth, weaning and yearling weights of Sohagi sheep to make effectiveadjustments to the plan of breeding and improvement of its mutton production.

MATERIALS AND METHODS

Data and pedigree information

The pedigree information and the data used in the current study were obtained from the sheep flock of the experimental farm, Faculty of Agriculture, Sohag University from 2001 to 2021 according to Sohag Institutional Animal Care and Use Committee (Sohag-IACUC), No. 6-12-2022-02.The flock has been raised under lambing system of three crops every two years. The seasons of mating were in January, May and September, where ewes were divided into groups, each of which 30 ewes joined the ram for 45 days. The flock was fed on concentrates such as soybeans and corn, and green fodder (*Trifolium alexandrinum*) in the winter**.** Lambs were weighed at birth to assign birth weight, then body weights were recorded biweekly till weaning followed by monthly

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weights till the animals were removed from the flock. The included traits were birth weight (BW),weaning weight at 90 days (W90), and yearling weight at 360 days of age (W360). The data included 1290 lamb records originated from 44 sires and 491 dams.

Statistical analysis

The CFC software (Sargolzaei *et al.*, 2006) was used to calculate pedigree statistics and coefficient of inbreeding for each individual in the pedigree. The GLM procedure of SAS program (version 9.1, 2003) was used to determine the fixed factors affecting the investigated traits. All interactions in the initial model were non-significant and deleted in the final model according to the following model:

$$\mathbf{Y_{ijklmn}=\mu+G_i+R_j+S_k+T_l+P_m+e_{ijklmn}\ (1)}$$

Where, Y_{ijklmn} is the observation of the response variable (BW, W90 or W360) of n^{th} animal of i^{th} gender, j^{th} year of birth, k^{th} season, l^{th} type of birth and m^{th} parity; μ is the overall mean; G_i is the fixed effect of gender (1=male and 2=female); R_j is the fixed effect of year of birth (2001 to 2021), S_k is the fixed effect of season (1, 2 and 3), T_l is the fixed effect of type of birth (single and twin), $P_m$is the fixed effect of parity (1,2, …and 8), and e_{ijklmn} is the random residual error assuming to be NID (0,σ^2 e).

Triplet lambs were not included in the present study because of the low frequency of triple births. Also, trend of inbreeding coefficient over studied years was estimated using linear regression of animal inbreeding coefficient on the year of birth using Reg. procedure of SAS program.

The inbreeding depression was expressed as a partial linear regression coefficientof body weight traits on inbreeding coefficients of the animals. It is interpreted as a change of body weight influenced by 1% increase of inbreeding coefficient. The single trait animal model program (MTDFREML) proposed by Boldman *et al.* (1995) was used to estimate the breeding values of animals as well as the inbreeding effect on the studied traits according to the following model:

$$\mathbf{Y=X\beta+Z_a a+e,\ (2)}$$

Where, Y = N vector of observations of BW, W90, and W360, X= the incidence matrix for fixed effects mentioned previously in model (1), β = the vector including the overall mean and the same fixed effects as those stated in model (1) plus inbreeding coefficient as covariate term, Z_a= the incidence matrix for random effects, a = the vector of direct genetic effect of animal with zero mean and variance equal σ^2aA where A is the numerator relationship matrix and e = a vector of random residuals normally and independently distributed with zero mean and variance σ^2eI .

Also, breeding values (BV's) were estimated from the single trait animal model program (MTDFREML) without adding inbreeding coefficient as a covariate term. For each trait, Spearman rank correlation coefficient between BV's obtained from adding ornot addinginbreeding coefficient as covariate term were calculated to see whether or not the adding inbreeding level could change the animals' rank.

RESULTS AND DISCUSSION

Pedigree analysis and inbreeding coefficients estimated in this study are presented in Tables 1 and 2. The number of inbred Sohagi sheep was 443 representing 34.34% of the data. The average inbreeding coefficient of studied animals and inbred animals was 1.96 and 6.57%, respectively. The inbreeding coefficient of inbred animals ranged from 0.02 to 37.5%. The maximum value of inbreeding coefficient of 37.5% may indicate that some matings occurred between close relatives, but these matings were few (Mandal *et al*., 2005; Elsaid *et al*., 2018). The average inbreeding coefficients was low (1.95%) in Sohagi sheep and this value was higher than 0.6% for Tori-Bakktiari sheep (Barros *et al*., 2017), 1.26% for Dorper sheep (Vatankhah *et al*., 2019), and 1.62% for Shall sheep (Hashemi and Hossein-Zadeh, 2020). Also, the value of inbreeding coefficient obtained in this study was lower than 2.93% for Moghani sheep (Hossein-Zadeh, 2012a) and 6.73% for Brarillian Morada Nova hair sheep (McManus *et al*., 2019). These differences in the average level of inbreeding may be due to the differences in mating systems (Gholizadeh and Kesbi, 2016).

Table 1. Description of the present data set and pedigree analysis.

Parameter	Number
No. of individuals with known parents	1290
No. of sires	44
No. of dams	491
No. of individuals with no progeny	956
Full-sib groups	266

Table 2. Average inbreeding coefficients estimated in the present data.

Parameter	Unit
No. of inbred animals	443
Inbred animals%	34.34
Non-inbred animals (F=0) %	65.66
Average inbreeding coefficient of studied animals (%)	1.95
Average inbreeding coefficient of inbred animals (%)	6.57
Range of inbreeding coefficient of inbred animals (%)	0.02-37.5

F= Inbreeding coefficient

The analysis of variance for non-genetic factors affecting the investigated traits is presented in Table 3. Results showed that lambs's gender, type of birth, season, and year of birth significantly affected the studied traits. Meanwhile, parity had no significant effect on all traits investigated. Means and standard errors of studied traits are presented in Table 4. Results indicated that females showed significantly (P<0.01) lower body weights compared with males at all ages.

Table 3. Analysis of variance for body weight at birth (BW), weaning (W90), and yearling (W360) of Sohagi sheep.

Sources of variation	d.f.	MS		
		BW	W90	W360
Total	1289			
Gender	1	1.63**	320.11**	11142.31**
Type of birth	1	27.23**	509.75**	682.46**
Season	2	1.57**	124.84**	130.64**
Birth year	19	1.41**	40.54**	88.50**
Parity	7	0.33	11.42	39.55
Residual	1259	0.22	5.77	25.51

**** significant at P<0.01.**

Also, lambs born as a twin had significantly (P<0.01) lower body weights than lambs born as a single. These results are in agreement with Dixit *et al*. (2001), who found that the effect of gender and type of birth was significant on the lamb' weight. Lambs born in summer and autumn were significantly (P<0.01) lighter in weight than those born in winter. This finding was in consistent with Norouzian (2015) and Stritzke and Whiteman (1982), who found that lambs born in summer or autumn were lighter at birth and weaning than those born in winter.

Table 4. Means and standard error (SE) for body weights (BW, W90, and W360) as affected by gender, type of birth, season and year of birth and parity. (mean±SE)

Item	N	BW	W90	W360
Overall	1290	2.98±0.01	15.05±0.07	32.61±0.17
Gender				
Male	685	3.03^{a}±0.03	15.65^{a}±0.17	36.32^{a}±0.36
Female	605	2.96^{b}±0.03	14.61^{b}±0.16	30.20^{b}±0.33
Type of Birth				
1 (Single)	760	3.15^{a}±0.03	15.79a±0.16	34.03^{a}±0.33
2(Twin)	530	2.84^{b}±0.03	14.47^{b}±0.17	32.49^{b}±0.36
Season				
1 (Winter)	444	3.07^{a} ±0.04	15.75^{a}±0.18	33.38^{a}±0.38
2 (Summer)	395	2.95^{b} ±0.04	15.04^{b}±0.18	33.78^{a}±0.38
3 (Autumn)	451	2.95^{b} ±0.04	14.59^{c}±0.18	32.62^{b}±0.38
Year of birth				
2001	49	2.91^{efg}±0.08	16.63^{a}±0.39	35.10^{abcd}±0.81
2002	121	3.06^{bcdef}±0.05	15.71^{abcd}±0.26	33.31^{bcde}±0.55
2003	75	2.77^{efg}±0.06	14.52^{abcd}±0.32	33.54^{ab}±0.66
2005	6	3.17^{bcd}±0.19	16.76^{a}±0.99	33.69^{de}±2.09
2006	27	2.83^{edfg}±0.09	15.22^{abcd}±0.47	33.54^{bcde}±1.00
2007	13	3.02^{bcdef}±0.13	14.65^{bcd}±0.68	34.96^{bcde}±1.42
2008	13	3.21^{bcde}±0.13	15.30^{bcd}±0.69	32.65^{e}±1.45
2009	12	3.14^{b}±0.14	15.18^{abcd}±0.72	32.61^{bcde}±1.48
2010	17	3.60^{a}±0.12	15.54^{a}±0.59	35.44^{a} ±1.25
2011	66	2.97^{bcde}±0.06	14.71^{abcd}±0.33	33.08^{abcd}±0.69
2012	26	3.09^{bc}±0.10	15.69^{ab}±0.49	32.14^{bcde}±1.04
2013	105	3.13^{bcd}±0.05	15.28^{abcd}±0.28	32.61^{bcde}±0.58
2014	84	3.06^{bcde}±0.06	14.94^{abcd}±0.30	31.76^{bcde}±0.63
2015	57	2.65^{g}±0.07	15.72^{abc}±0.34	34.80^{abc}±0.73
2016	88	2.90^{cdefg}±0.06	15.36^{abcd}±0.28	34.64^{abc}±0.59
2017	142	2.91^{bcdefg}±0.05	15.96^{a}±0.24	33.51^{abcd}±0.49
2018	126	2.89^{cdefg}±0.05	14.27^{bcd}±0.24	32.29^{abcde}±0.51
2019	130	2.99^{bcdef}±0.05	13.99^{cd}±0.24	30.82^{cde}±0.50
2020	113	2.98^{bcdef}±0.05	13.70^{d}±0.24	32.68^{abcde}±0.51
2021	20	2.56^{fg}±0.11	13.47^{abcd}±0.56	32.05^{abcd}±1.18
Parity				
1	489	2.95±0.03	14.91±0.14	32.72±0.30
2	304	3.03±0.03	15.15±0.16	33.17±0.34
3	216	2.99±0.04	15.11±0.19	32.28±0.39
4	142	3.04±0.04	15.77±0.22	33.79±0.47
5	69	2.94±0.06	15.04±0.30	33.63±0.64
6	33	2.89±0.08	14.92±0.43	33.34±0.90
7	25	3.07±0.10	14.78±0.49	32.89±1.04
8	12	3.03±0.14	15.35±0.72	34.26±1.50

Different letters a, b and c in the same column are significantly different (P<0.05).

Investigated body weights tended to fluctuate significantly (P<0.01) over the year of birth without specific trend. These findings may be due to feeding level, management under which theherd was maintained during the studied years and the variation in the environmental conditions (Elsaid *et al.*, 2018). The same trend was observed with parity but with no significant differences (P>0.05).

The number of inbred and non-inbred animals, and changes of inbreeding level (F%) over years are presented in Figure. 1. The number of individuals varied over time. The big increase in the rate of inbreeding in some years may be because of intensive use of small number of sires for matings.

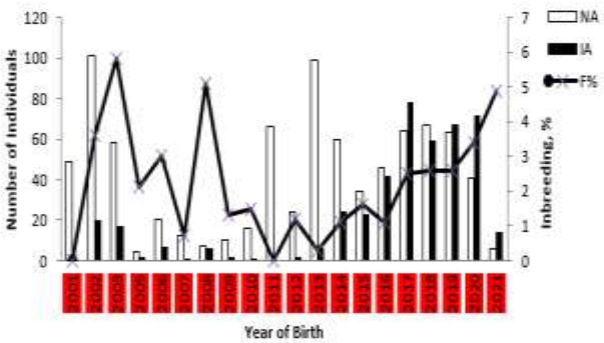

Figure 1. Changes in level of Inbreeding (F%) over the studied years, number of non inbred animals (NA) and number of inbred animals (IA).

The lower inbreeding rate in some years may be due to the lack of selection superior sires in this sheep population. These results are in consistent with Eteqadi *et al.* (2014) and Hashemi and Hossein-Zadeh (2020).

The inbreeding coefficient trend over the investigated years is presented in Table 5. The trend of overall inbreeding coefficient (inbred and non-inbred animals) and that for inbred animals were significantly negative (P<0.01). Similar results were reported in other breeds (Rashedi *et al.*, 2013; Elsaid *et al.*, 2018).

Inbreeding depression could be expressed as a partial linear regression coefficient for values of body weights on inbreeding coefficient of the animals. Regression coefficients of investigated traits on inbreeding coefficients of the animals are presented in Table 6. Non-significant (P>0.05) and negative effect of inbreeding was observed in the current study for birth and weaning weights, but it was non-significant (P>0.05) and positive effect on yearlingweight. These results are in agreement with Elsaid *et al.* (2018), who found both non-significant and significant effects of inbreeding on body weight traits in Barki sheep. But the results are inconsistent with Barros *et al.* (2017) and Kiya *et al.* (2019), who did not find any significant effect of inbreeding on body weight traits of different sheep breeds.

Table 5. Inbreeding coefficients over studied years for inbred and non-inbred animals.

Parameter	b±SE
Overall inbreeding coefficient (non-inbred and inbred animals	-0.0003**±0002
Inbreeding coefficient for inbred animals	-0.01**±0.001

****= significant at P<0.01**

Table 6. Regression coefficients with their standard errors of BW, W90 and W360 (kg) on inbreeding coefficient of the animal.

Trait	b±SE
BW	-0.004±0.024
W90	-0.002±0.025
W360	0.009±0.023

All the regression coefficients were not significant (P>0.05).

Table 6 showed that birth weight and weaning weight decreased by 0.004 and 0.002 kg per one percent increase in inbreeding coefficient. While each 1% increase in coefficient of inbreeding resulted in an increase of 0.009 kg in yearling weight. These results are in agreement with Thompson *et al.* (2000), Sierszchulski *et al.* (2005), and Barczak *et al.* (2009), who found low inbreeding depression for other livestock breeds.

Coefficient of rank correlation between estimated BV's of animals obtained from addingor not addinglambs inbreeding coefficients as a covariate term is presented in Table 7. No changes were observed in the animals' rankings due to adding inbreeding coefficients as a covariate term. These findings are in consistent with Barczak *et al*. (2009), Rashidi *et al*. (2015), and Gholizadeh and Kesbi (2016).

Table 7. Rank correlation of Spearman between estimated BV's of animals (adding or not adding of inbreeding coefficients as a covariate term).

Trait	r_s
BW	0.989
W90	0.999
WW	0.999

r_s= spearman correlation

CONCULSION

In the current study, number of inbred animals contributed to 34.34% of all dataset. Inbreeding coefficient ranged from 0.02 to 37.5%. Inbreeding depression insignificantly decreased body weight traits from birth to 3 months of age but insignificantly increased the yearling weight. It was concluded that inbreeding showed negligible effect on studied body weight traits. The inbreeding level was not very high (1.95%) to be a major concern, but continuous monitoring of inbreeding is important to avoid high levels of inbreeding and thus prevent a significant decline in the body weights of Sohagi sheep. Increasing number and replacement of rams used for mating can be a successful strategy to reduce the level of inbreeding.

REFERENCES

Akhtar, P., Ahmad, Z., Mohiuddin, G. and Abdullah, M. (2000). Effect of inbreeding on different performance traits of Hissardale sheep in Pakistan. Pakistan Vet. J., 20(4): 169-172.

Bannasch, D., Famula, T., Donner, J., Anderson, H., Honkanen, L., Batcher, K., Safra, N., Thomasy, S. and Rebhun, R. (2021). The effect of inbreeding, body size and morphology on health in dog breeds. Canine Medicine and Genetics, 8(12):1-9.

Barczak, E., Wolc, A., W´ojtowski, J., Sl´osarz, P. and Szwaczkowski, T. (2009). Inbreeding and inbreeding depression on body weight in sheep. J. Anim. Feed Sci. 18, 42–50.

Barros, E.A., Brasil, L.H., de, A., Tejero, J.P., Delgado-Bermejo, J.V. and Ribeirod, M.N. (2017). Population structure and genetic variability of the Segure˜na sheep breed through pedigree analysis and inbreeding effects on growth traits. Small Rumi. Res. 149, 128–133.

Boldman, K. G., Kriese, L.A. Van Vleck, L. D. Van Tassell, V. and Kachman, S. D. (1995). A manual for use of MTDFREML.A set of programs to obtain estimates of variances and covariances (DRAFT). U.S. Department of Agriculture, Agricultural Research Service, 120pp.

Dixit S.P; Dhillon, J.S. and Singh, G. (2001). Genetic and non-genetic parameter estimates for growth traits of Bharat merino lambs. Small Ruminant Research, 42: 101-104.

Drobik, W. and Martyniuk, E. (2016). Inbreeding and its impact on the prolific Polish Olkuska sheep population. Small Ruminant Research, 137: 28–33.

Elsaid, Reda, Salwa El-Wakil, I. and El-Gabbas, H.M. (2018). Effect of inbreeding on some body weights in egyptianbarki sheep. Egyptian Journal of Sheep & Goat Sciences, Vol. 13, No. 2, P: 1 -7.

Eteqadi, B., Hossein-Zadeh, N.G. and Shadparvar, A.A. (2014). Population structure and inbreeding effects on body weight traits of Guilan sheep in Iran. Small Rumi. Res. 119, 45–51.

Gholizadeh, M. and Kesbi, F. G. (2016). Inbreeding depression in growth traits of Baluchi sheep. Small Ruminant Research 144: 184–190.

Hashemi, M. and Hossein-Zadeh, N. G. (2020). Population genetic structure analysis of Shall sheep using pedigree information and effect of inbreeding on growth traits. Italian Journal of Animal Science, 19(1): 1196–1204.

Hossein-Zadeh N. G. (2012). Inbreeding effects on body weight traits of Iranian Moghani sheep. Arch Anim Breed. 55(2): 171–178.

Hossein-Zadeh, N. G. (2012a). Inbreeding effects on body weight traits of Iranian Moghani sheep. Arch Anim Breed. 55(2):171–178.

Hussain, A., Akhtar, P. Ali, S. Younas, M. and Shafiq, M. (2006). Effect of inbreeding on pre-weaning growth in Thalli sheep. Pakistan Vet. J., 26: 138-140.

Kiya, C.K., Pedrosa, V.B., Muniz, K.F.A., Gusm˜ao, A.L. and Batista, L.F.P. (2019). Population structure of a nucleus herd of Dorper sheep and inbreeding effects on growth, carcass, and reproductive traits. Small Rumi. Res. 177, 141–145.

Vostry, L., Milerski, M., Schmidova, J. and Vostra-Vydrova, H. (2018). Genetic diversity and effect of inbreeding on litter size of the Romanov Sheep. Small Rumin. Res., 168: 25–31.

Mandal, A., Pant, K.P. Notter, D. R. Rout, P.K. Roy, R. Sinha, N.K. and Sharama, N. (2005). Studies on inbreeding and its effects on growth and fleece traits of Muzaffarnagari sheep. Anim. Sci., 18: 1363-1367.

McManus, C., Fac´o, O., Shiotsuki, L., Jivago de Paula Rolo, J.L. and Peripolli, V. (2019). Pedigree analysis of Brazilian Morada Nova hair sheep. Small Rumin. Res., 170, 37–42.

Norouzian, M. A. (2015). Effects of lambing season, birth type and sex on early performance of lambs. N. Z. J. Agric. Res., 58(1):84-88.

Rashedi D. A., Fayazi J. and Vatankhah, M. (2013). Investigating inbreeding trend and its impact on growth traits of Lori-Bakhtiari Sheep. J. Ruminant Research, 1: 65-78.

Rashidi, A., Mokhtari, M.S. and Guti´errez, J.P. (2015). Pedigree analysis and inbreeding effects on early growth traits and greasy fleece weight in Markhoz goat. Small Rumin. Res., 124, 1–8.

Sargolzaei, M., Iwaisaki, H. and Colleau, J.J. (2006). CFC: a tool for monitoring genetic diversity. International Proceedings of the 8th World Congress on Genetics Applied to Livestock Production, CD-ROM Communication, Aug 13-18, Belo Horizonte, Brazil.

SAS (2003). SAS User's Guide: Version 9.1. SAS Institute Inc., Cary, NC.

Sierszchulski J., Helak M., Wolc A., Szwaczkowski T. and Schlote W. (2005). Inbreeding rate and its effects on three body conformation traits in Arabian mares. Anim. Sci. Pap. Rep. 23, 51-59.

Špehar, M., Ramljak, J. and Kasap, A. (2022). Estimation of genetic parameters and the effect of inbreeding on dairy traits in Istrian sheep. Italian Journal of Animal Science, 21(1): 331–342.

Stritzke, D.J and Whiteman, V. (1982). Lamb growth patternsfollowing different seasons of birth. Journal ofAnimal Science 55: 1003–1007.

Tagada, Itsasne, G., Silvia Teresa, R. R., Legarra, A. and Ugarte, E. (2020). Inbreeding and coancestry in Latxa dairy sheep breed. J. Dairy Sci., 103(6):5221-5224.

Thompson J.R., Everett R.W. and Wolfe, C.W. (2000). Effects of inbreeding on production and survival in Jerseys. J. Dairy Sci. 83, 2131-2138.

Vatankhah M., Sigdel A. and Abdollahi-Arpanahi, R. (2019). Population structure of Lori-Bakhtiari sheep in Iran by pedigree analysis. Small Rumin Res. 174:148–155.

Vostry, L., Milerski, M., Schmidova, J. and Vostra-Vydrova, H. (2018). Genetic diversity and effect of inbreeding on litter size of the Romanov Sheep. Small Rumin. Res., 168: 25–31.

Yganehpour, Z.,Roshanfekr, H., Fayazi, V.,Beiranvand , M. H. and Ghaderzadeh, M. (2015). Study of pedigree structure and effects of inbreeding depression on growth traits in Lorestan native sheep. Iranian Journal of Animal Science Research, 7(2):199-207.

Yeganehpur, Z., Roshanfekr, H. Fayazi, J. and Beyranvand, M. H. (2016). Inbreeding depression on growth traits of Iranian Lori sheep. Rev. Colomb. Cienc. Pecu., 29: 264-273.

تأثيرالتربية الداخلية على أوزان الميلاد والفطام والسنة فى الأغنام السوهاجى

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الملخص

إستهدفت الدراسة تقدير تأثير التربية الداخلية على أوزان الجسم عند الميلاد، الفطام (عمر 90 يوم) وعند عمر سنة. استخدم فى هذه الدراسة عدد 1290 سجل من الحملان السوهاجى أبناء 44 كبش و 491 أم تمت تربيتهم في المزرعة التجريبية بكلية الزراعة - جامعة سوهاج من عام 2001 حتى 2021. تم دراسة تأثير العوامل غير الوراثية على الصفات المدروسة. كان متوسط الوزن (كيلوجرام/حيوان) عند الميلاد (2.98±0.01) والفطام (15.05±0.07) وعند عمر سنة (32.61±0.17)، على التوالي. أظهرت النتائج أن عدد الحيوانات المرباه تربية داخلية يمثل نسبة 34.34٪ من البيانات الكلية. وقدرمتوسط معامل التربية الداخلية لهذه الحيوانات بنسبة 6.57٪ وتراوحت هذه النسب بين 0.02 إلى 37.5٪ . أوضحت النتائج أن تقدير معامل إنحدار معامل التربية الداخلية لكل الحيوانات على سنة الميلاد (-0.0003) ومعامل انحدار معامل التربية الداخلية للحيوانات المرباة تربية داخلية على سنة الميلاد (-0.01) كان سالبا ومعنويا. إنخفض الوزن عند الميلاد والوزن عند الفطام بمقدار 0.004 و0.002 كجم لكل زيادة بنسبة 1٪ في معامل التربية الداخلية مع زيادة في الوزن عند عمر سنة (0.009 كجم). أظهرت نتائج معامل الإرتباط سبيرمان بين تقدير القيم التربوية للحيوانات التي تم الحصول عليها من تضمين واستبعاد معامل التربية الداخلية فى الموديل كإنحدار، أنه لا توجد تغييرات في ترتيب الحيوانات. استنتج من نتائج هذه الدراسة أن للتربية الداخلية تأثير ضئيل على صفات وزن الجسم المدروسة. أيضا يمكن أن تكون زيادة عدد كباش التربية واستبدالها المتكرر استراتيجية فعالة لتقليل مستوى التربية الداخلية.