Performance of Karadi Lambs Screened from Elite Flocks

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Abstract:- Karadi sheep in Kurdistan, Iraq provide sustainable organic commodities. Productivity of Karadi is rather low and cause low efficiency of meat production. The objective of this work was to develop breeding strategies for improving productivity of Karadi sheep. Performance test was carried out on 32 young Karadi lambs. The Karadi lambs were screened, selected and purchased from commercial sheep flocks from four different geographical-ecological zones (Sharazoor, Halabja, Sharbazher, and Penjween) in Sulaimani governorate. Eight lambs from each of the 4 ecological zones were randomly assigned to 2 feeding treatments (concentrate diet vs. whole barley grain). Body weights and dimensions were monthly recorded. Overall mean of the body weight at 9-month old was 38.0±1.5 kg. Overall means of body length, height at withe, chest depth, heart girth and chest widths at 9-month old were 68.6±0, 64.9±0.6, 30.1±0.3, 86.2±1.1, 17.1±0.2 cm, respectively. Geographic locations had a significant effect on body weights along performance testing period. One of the reasons for such differences may be due to genetic make-up variation among lambs of the different geographic locations. This may confirm the possibility of screening high genetic make-up young lambs as a tool for selection for genetic improvement of Karadi sheep for meat production. It was concluded that implementation of screening young lambs and performance testing project for improvement of productivity of Karadi sheep can be adopted successfully.

Key words: - Sheep, Screening young lambs, Performance test, Karadi sheep.

1 Introduction

Sheep are considered the most important farm animals in Kurdistan, and the greatest portion of the income comes from the sale of lambs. Productivity of Karadi is rather low and likely to cause low efficiency of meat production [1]. The organic products from Karadi kept in bio-diverse husbandry systems would be likely to easily find a market among health urban people. The products of these native breeds are of high quality (good taste and flavor) as compared with products of exotic breeds. Most native breeds are scavengers by nature and supplementary feeding is a rare practice. Generally Karadi sheep graze extensively on natural pasture, stubble and crop residues for more than six months annually. Therefore, improving pastures, use of supplementary feed and establishment a center for improving Karadi genetically in order to disseminate improved rams to farmers is vital issues. It has been reported that 98.2% of the sheep owners in Sulaimani province depend on selecting their rams from their own flock, as there is no real genetic program for sheep [2]. Work by [3] pointed out that when breeding rams were selected from their respective flocks, this might imply the relationship of animals within a flock to be high and cause a high inbreeding coefficient. The low level of inflow of animals of unrelated population may further increase the level of inbreeding. It is well documented that gains from breeding programmes are achieved only when inbreeding is controlled or minimized [4]. According to [5], inbreeding can be minimized by breeding males from other flocks to mix with breeding females of the flock. The advantage of performance test over visual appraisal is that there is less risk of subjective evaluation or guesswork as more emphasis is placed on characteristics of high economic importance [6]. Designing and implementation of community-based breeding programs require a good support by the farmers and accurate methods of identifying the superior

genotypes [7, 8]. Several authors found genetic variation among breeds for growth rate [9, 10]. This may confirm the possibility of screening young lambs and testing performance as a tool for selection of heaver lambs for genetic improvement of Karadi sheep for meat production. The trend in growing lambs in the current investigation was similar to that found earlier [11].
The aim of the present study was to initiate a first step towards a development of breeding strategies for Karadi sheep via screening and selection young male lambs, from commercial elite flocks, based on their body weight at weaning, dam's milk yield, wool quality, conformation and type of birth to meet organic meat demand by the increasing human population.

2- Materials and methods

This experiment was carried out at the Sheep Farm, Animal Production Experimental Unit, Dept. of Animal Production, Faculty of Agricultural Sciences University of Sulaimani, Bakrago, Sulaimani, Iraq, over the periods of May 13 to November, 20, 2012. Thirty two Karadi ram lambs were screened, selected and purchased from commercial sheep flocks of four different ecological zones (Sharazoor, Halabja, Penjween and Sharbazher) in Sulaimani governorate. The lambs were assigned to performance test (body weights, growth and body dimensions). Lambs had free access of water. The initial live body of the thirty two male Karadi lambs averaged 27.066±1.043kg with average age of about 5.5 months old at the start of the experiment. Eight lambs of each of the 4 ecological zones were randomly assigned to one of 2 feeding treatments (concentrate diet vs. whole barley grain). All lambs were received an equal daily allowance of both feed rations (given twice-a-day) at a level of 2% of their body weights with 4-6 hours a day stubble grazing. Straw was provided in the troughs *ad libitum*. Ration treatments were offered for 2 weeks as adaptation period followed by 12 weeks of experimental feeding period. The concentrate ration had 15.2% CP% and 2750 ME (cal/kg).The lambs were weighed weekly and body dimensions (body length, height at withers, chest width and chest depth) were taken monthly.

For the preference and monitoring sheep owners, a total of eight stakeholders were invited and interviewed at lamb's performance station, to evaluate the lambs at the end of the performance test. The objective of the meeting was to check willingness of the sheep keepers to buy any of the young rams for breeding purposes. A questionnaire was prepared and included the following questions: Your opinion on the project idea, do you want to buy any of the young rams you see? Are you ready to pay more money for such ram? Will the project contribute to the improvement of Karadi sheep? Are the anticipated project costs warranted given the expected project results and benefits? Your opinion on the project's effectiveness and efficiency, Your opinion on the collaboration aspects of the project, Do you prefer to get new breeding ram periodically? What selection criteria do your decision made?

General Linear Model within the statistical program XLSTAT [12] was used to analyze the factors affecting productive trait within the Complete Randomized Design (geographic location and feeding regime and their interactions).

3-Results

Overall mean of the body weight at 9-month old (final weight at the end of performance test) was 38.0±1.5 kg Table (1) presented body weights during experimental period. Feeding concentrate to Karadi lambs significantly ($P<0.05$) had higher body weights than that fed barley in all stages of the experimental period (at 6-, 7-, 8-, and 9-month old). Body weight at the end of experimental period (9-month old) showed that Karadi lambs fed concentrate had significantly ($P<0.05$) higher total body gain (9.4 kg) compared to Karadi lambs fed barley (42.7±1.4 vs. 33.3±2.1 kg). Geographic locations had a significant effect on body weight along experimental period. This may be due to genetic make-up variation among lambs

of the different geographic locations. There was a high significant interaction between geographical locations and feeding regimes on body weights. This may indicate that lambs of different locations responded differently to feeding diets during experimental period. The body weights of lambs at all stages of the experimental period brought from Sharazoor which fed concentrate were significantly were heaviest than lambs brought from other locations (Sharbazher, Penjween and Halabja). The means of body weights of lambs purchased from Sharazoor and fed concentrate were 33.4±2.2, 39.9±1.9, 42.1±1.9 and 46.6±2.1 kg at 6-, 7-, 8- and 9-month old, respectively. The results showed that it is possible to test lambs performance specially body weights at different ages between weaning up to 9-month old. Feeding regime as well as geographic locations significantly ($P<0.05$) affected body dimensions (body lengths, height at wither, chest depth, heart girth and chest width) at 9-month old of lambs. Overall means of body lengths, height at wither, chest depth, heart girth and chest widths at 9-month old were 68.6±0, 64.9±0.6, 30.1±0.3, 86.2±1.1, 17.1±0.2 cm, respectively (Tables 2). Feeding concentrate resulted in a higher body dimensions than feeding barley. There was a high significant interaction between geographical locations and feeding regimes on body length. This may indicate that lambs of different locations responded differently to feeding regime during the performance test.

The main core of this study was to figure out the possibility of selection for implementation of young lambs screening plan of Karadi breed for genetic improvement of growth (body weights) and body conformation (body dimensions). To seek further efficient and effective mobilization of necessary steps to continue supporting the screening young lambs program in Kurdistan, It is important to carry out the second part of the program, which included monitoring of sheep owners as essential step in the future plan of improving Karadi sheep, as the beneficiaries of the program will be sheep owners. A total of eight stakeholders, which will be benefit from the project, were invited and interviewed at lamb's performance station, to evaluate the project. Discussion of the project objectives, what has been done and essential information were exchanged in order to focus on priorities that should be considered for sustainable screening and performance testing of young lambs. The feedback of the sheep owners agreed on the importance of the screening young lambs and performance testing project, which will enhance efficiency and effectiveness of the improvement of productivity of Karadi sheep, and to strengthen cooperation to support and complement the efforts of sheep owners in the process of implementation of genetic improvement. Appraisal of the project, evaluating and judging the tested lambs were assessed by sheep owners through visual scoring and ranking each tested lamb. Based on judging priorities of sheep owners for elite lambs, which were ranked according to the selection criteria of body weight and dimensions, top 24 of the lambs were selected for semen quality evaluation before using them as breeders rams [13]. The rest of the lambs were slaughtered for carcass evaluation for further investigation of variation among geographical areas [13]. It is interesting to mention that all sheep owners selected top best 3 lambs, because they were superior in criteria based on the followings sheep owners preference: Body weight, conformation, size as well as visual appraisal (broad and long fat tail, big head and dark color of face).

4- Conclusion

High productive performance can be achieved through introducing new techniques, (screening young male lambs and performance testing), as genetic variation among lambs of the different geographic locations was noticed in this study. The performance test can be establishing as a community based breeding cooperatives, which will be important to steer and direct the genetics program. As sheep herders indicated their willingness to adopt such program, this is a good sign to increase organic meat (and consequently milk) production in the future

through adoption new breeding as well as encouragement farmers to establish cooperative. Screening of a number of flocks to identify elite young rams, would expect to be more productive and profitable. Implementing appropriate technological alternatives to increase organic meat is complicated and may be offset by the fact that most flocks suffer from shortage of feed. So mixed farming through integration of livestock with crop production should be developed as a top priority in Kurdistan, Iraq to secure forage production. Such scenario may improve productive as well as reproductive performance and consequently increased organic meat and milk as well as increase sheep owner profits.

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Table 1. Mean± S.E of body weights during experimental period across geographic locations and feeding regime.

Age (months)		6	7	8	9
Overall mean		28.7±1.1	34.1±1.3	35.0±1.4	38.0±1.5
Feed	Barley	26.7±1.7b	31.1±2.1b	31.0±1.9b	33.3±2.1b
	Conc.	30.7±1.3a	37.1±1.4a	39.0±1.5a	42.7±1.4a
1- Sharazoor		31.9±1.4a	37.1±1.6a	38.5±1.8a	42.0±2.4a
2- Halabja		29.3±1.9a	35.1±2.5b	36.4±2.5b	38.8±2.9b
3- Penjween		21.4±2.1b	25.9±2.7c	26.7±2.9c	29.8±3.3c
4- Sharbazher		32.4±0.96a	38.3±1.1a	38.5±1.4a	41.5±1.5a
Feed x Location Interaction	Barley x 1	30.4±1.7ab	34.4±1.9b	35.0±1.6ab	37.4±2.7b
	Barley x 2	26.6±3.1ab	31.5±4.3c	32.2±3.5c	33.5±3.9c
	Barley x 3	18.3±2.6c	21.0±3.02d	21.3±3.1d	23.0±3.2d
	Barley x 4	31.6±1.1a	37.6±1.11a	35.8±1.1b	39.4±1.4b
	Conc. X 1	33.4±2.2a	39.9±1.9a	42.1±1.9a	46.6±2.1a
	Conc. x 2	31.9±1.6a	38.7±1.7a	40.7±2.03a	44.1±2.02a
	Conc. x 3	24.500±2.7bc	30.800±2.9c	32.050±3.2c	36.700±2.9bc
	Conc. x 4	33.225±1.7a	39.125±1.9a	41.375±1.8a	43.775±2.4a

Means with different letters within each factor for each age differ significantly ($p<0.05$)

Location 1: Sharazoor 2: Halabja 3: Penjween 4: Sharbazher

Table 2. Overall mean± S.E of body dimensions (cm) during experimental period

Age (months)	(6)	(7)	(8)	(9)
Body length	57.8±0.8	59.4±0.8	64.4±0.9	68.6±0.6
height at withers	58.5±0.6	59.8±0.6	62.7±0.6	64.9±0.6
Chest depth	24.8±0.4	26.2±0.4	28.2±0.4	30.1±0.3
Heart girth	71.03±1.2	74.2±1.1	80.4±1.2	86.2±1.1
chest width	14.6±0.2	15.8±0.2	16.3±0.2	17.1±0.2