Effect of Physical Processing of Barley Grain on Birth Weight of Moghani Lambs

Hossein Tabatabai, Orang Esteghamat

Department of Animal Science, Astara Branch, Islamic Azad University, Astara, Iran

ABSTRACT

This investigation was carried out to study physical processing of barley grain on birth weight and milk production of Moghani ewes. Twenty Moghani pregnant ewes were used in completely randomized design with four treatments each containing five replications. In this experiment all sheep were carried for pasture with herd and in the first night they were fed with 500gr of processed barely grain. The adaptation period was 14 days and pregnant ewes were fed for the trial period of 30-35 days before delivery until 30-35days postpartum. Experimental treatments including diet containing unprocessed barely grain (control), (2) milled barely grain, (3) soaked barley grain and (4) grinded barely grain. The results showed that in this experiment, different physical processing methods had no significant influence on ewes dry matter intake in all of production phases, but had significant influence on birth weight of Moghani male lambs and amount of milk production and in the different processing methods, performance of treatment containing grinded barley grain was significantly better than other treatments ($p \leq 0.05$).

Keywords: Birth weight, Grinded barely grain, Moghani ewe, Physical processing

INTRODUCTION

With attention to role of feeding in economy and livestock industry dynamics, identifying available food sources and proper use of these resources for increasing efficiency are the key and important priorities for this industry [1]. The use of existing resources and increase their nutritional value is the one way to increase the efficiency of these products by increasing demand for animal products and food shortages. Given that nutrition plays an important role in the economy and dynamic livestock industry. Therefore, identification of food sources and proper use of these resources are the key priorities for this industry [2]. Improving nutritional value of grains due to significant contribution of diet and feeding of livestock has an utmost importance and any method that can increase efficiency and improve their nutritional value, should be considered. Because barley grain is the most important cereal grain used for production of energy in beef and dairy cattle rations and because it has high fiber its digestibility is lower than other cereals. Therefore, its process is, one of the main ways to change and improve the food value, especially starch and protein. It also increases the digestibility and palatability, make starch more available for microbes and therefore increase the rate and extent of starch degradation in the rumen [3].

Research Article, Acta Biologica Indica 2015, 4(1):107-110

pISSN 2319-1244, eISSN 2279-0160

MATERIALS AND METHODS
Preparation of ewes and assign them to test units

The purpose of the study is to investigate the effects of physical processing of barley grain on birth weight of Moghani male lambs and ewes milk quantity. 20 pregnant sheep in a completely randomized design with 4 treatments and 5 replicates were used to perform this experiment. Accustom cycle of 14-day, and pregnant ewes selected for testing from 30 to 35 days before calving to 30-35 day postpartum period were fed. Sheep herd on pasture intended to be used together in the first night in their boxes and were fed with 500 grams of grain as follows: First group - fed with diets containing barley grain without processing; The second group - fed with diet containing grinded barley grain; The third group - fed with diet containing soaked barley for 12 hours in common water; The fourth group - fed with diet containing chopped barley.

Preparing food diets

Given that all ewes used in these experiment were carried out to the pasture with herd so the type of their food components was same in pasture and while returning at night to the place, the same amount of (500g) processed barley applied by different physical ways and after a period of 14 accustomed days had given to them.

Evaluated Traits and Statistical Analysis

The evaluated traits are (1) birth weight of male lambs, (2) daily feed intake during ewes' lactation, and (3) the amount of milk produced by ewes. Three types of cold physical processes (milling, crushing and soaking for 12 hours in common water) were used in the processing of barley grain. The experiment of a completely randomized design based on statistical model was used to do this study:

$$Yij = \mu + Ti + \varepsilon\neg$$

where, Yij: each of the test observations, μ: population mean, Ti: effect of experimental groups, ε ij: experimental error. SAS software [4] for analyzing and Duncan's multiple range test was used for comparing means [5] on 5% aptness level ($p \leq 0.05$).

RESULTS AND DISCUSSION
BW of lambs

Based on data in table 1, the mean difference lambs BW between treatments of chopped barley with other treatments is significant at aptness level of 5% ($p \leq 0.05$). Also the independent comparison of treatment mean containing raw barley grain (non-processed) versus processed barley grain treatments on 5% aptness level is significant ($P \leq 0.05$). This indicates that physical processing of barley grain impacts on increase Moghani lambs birth weight. The topmost rate of birth is 4.30 kg that is about treatment containing chopped barley grain and the lowest is 3.74 kg is for treatment containing non-processed barley grain. It seems that the most impact of physical processing is about reduce in starch resistance to digestive responses, so that transverse ruptures, proteins more readily are available for secreted enzymes of microbial and animal sources that these results corresponded with findings of some researchers [6,7].

The quantity of ewes milk production

In different periods of breeding, means difference of ewes' milk production between different treatments was significant at the 5% aptness level ($p \leq 0.05$). And at all breeding periods the highest level is for treatment of chopped barley grain and the lowest for treatment of non-processed barley grain. This indicates that use of barleys' various physical processes ways affect the amount of ewes milk production. Some researchers to explain the decline in production reported that it is a result of grinded grain consumption of grain mill, hence increase in fatty acid production rate because of grinded barley consumption redound to sudden increase in insulin rate that subsequently may reduce milk production rate [2,3]. It should be noted that the ruminators needs to glucose, which get main part of it by Gluguneojener. Following the treatment of barley, improve in ruminal dissoluble and digestibility after ruminal with an impact on supply of glucose ingredients in the intestine and its absorption can decrease Gluguneojener and increase animal production [8].

Table 1. Comparing means of birth weight of male lambs (kg), disposal barley grain (gram) and amount of ewes milk production (gram) in whole breeding period.

Trait	Control	Treatment			SEM (%)	CV
	Barley grain without processing	Treatment content of grinded barley grain	Treatment content of soaked barley grain	Treatment content of chopped barley grain		
BW of male lambs	74.3d	82.3c	94.3b	3.4a	0.026	3.63
Ewes consumption barley grain (gram)	491a	490a	491a	491a	0.0192	1.82
Amount of ewes milk production (gram)	5.290c	16.295c	2.339b	6.368a	0.291	3.39

Different letters indicate significant difference between means ($P \leq 0.05$).

Ewes food consumption

The mean difference in food intake between treatments over the course of training at the 5% aptness level is meaningless ($p \leq 0.05$). This indicates that use of various methods of physical processing of barley in this study has no effect on feed intake of Moghani ewes. But based on findings in this field other processing methods can have a significant effect on feed intake that should be investigate, as some belief grain processing, especially barley, improves palatability, digestibility, nutritional value and consumption of it, because changes its chemical and physical desired direction. Also cereals processing and physically deformed food by a variety of methods, is an important factor in amount of feed consumed by livestock [9,10]. Also reported that barley grains weltered by steam and mid wide have highest production, which is because having high level of dry matter intake and high level of digestibility in rumen and intestine [11].

REFERENCES

[1] Yansari AT, Sadeghi H, Ansari-Pirsarai Z, Mohammad-Zadeh H. 2007. Int. J. Agri. Biol. 2002, 9, 439-442.

[2] Church DC. Livestock feeds and feeding, 2nd edn., Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1986.
[3] Orskov ER. J Anim Sci 1986, 63, 1624-1633.
[4] SAS Institute. SAS User's Guide, SAS Institute, Cary, NC, 2004.
[5] Duncan DB. Biometrics 1955, 11, 1-420.
[6] Theurer CB, Huber JT, Wanderlay RC. Dairy Sci. 1999, 72, 1950-1959.
[7] Van Soest PJ. Nutritional Ecology of the Ruminant, 2nd edn., Cornell University Press, USA, 1994.
[8] Dehghan-Banadaky M, Amanlou H, Nikkhah A, et al. Journal of Animal Feed Science and Technology 2008, 142(3), 306-316.
[9] Boyles SL, Anderson VL, Koch KB. Feeding barley to cattle. Ohio State University Extension, USA, 2004.
[10] Franklin T, Amaral-Phillips DM, Jackson JA, Campbell AA. J. Dairy Sci. 2003, 86, 2145-2150.
[11] Yang WZ, Beauchemin KA, Rode LM. J. Dairy Sci. 2000, 83, 554-568.