

ORIGINAL ARTICLE

Comparison the different methods of Physical Treatment of Barley seed on feed conversion ratio the Moghani lambs

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ABSTRACT

In order to compare the various methods of physical hot and cold processing the barley on feed conversion ratio of fattening lambs race Moghani, a test had done on 40 male lambs with an average weight of $0/746 \pm 27/63$ kg of completely randomized design, with 4 treatments and 10 replicates of each treatment period during 70 days. In this experiment, dietary energy level was 2/5 mega calories per kg and crude protein 14/ 7percent, according to NRC (1985), with the food items, hay, wheat straw, corn, soybean meal, barley, supplementary mineral materials, vitamin and salt was supply and adjusted. The treatments of test were: 1 - The mentioned feedlot diets containing whole barley grain without processing, as a control 2 - rations containing ground barley grain -3. Rations with wet grain 4 - grain diets have been parched. Results of experiment showed that average daily weight gain and feed conversion ratio in fed lambs with processed barley grain had significant difference ($p \leq 0/05$) with control (full grain). Among the various methods available for treating physical and cold, wet barley grain performance in daily weight gain and feed conversion ratio, significantly ($p \leq 0/05$) was better than other treatments.

Keywords: cold and hot processing, Moghani lambs, the wet grain, parched barley seed

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INTRODUCTION

the barley is a cereal that because of consistency in arid climate plant in many regions of world widely [1]. This cereal has many varieties and today in different climates, two-row and six-row barley is grown [2]. The metabolism energy of that is approximately 13/3 MJ/ kg for ruminators, and like all grains, protein have inferior quality and also have the lysine amino acid deficiency [3]. Chemical composition of different barley items can be changed under the influence of genetic factors and environmental factors [2,4,5].

The grain widely used and fed to ruminants as a source of energy and easily digested carbohydrates and its processing takes place for enhance access to digestive enzymes to the content of the endosperm.

Healthy pericarp of the grain is slightly digested in the rumen, because the whole grain is resistant to attack by microbes [6]. In addition, the grain is surrounded by a fibrous membrane that has a low digestibility. Unlike corn, which is well crunched under the influence of champing, barley is resistant against this action, and if full grain is used in animal feed, significant amount of it will eject through stool [7].

The primary goal of treatment in different ways of processing are, providing access the microbial enzymes to content of grain endosperm and increase the digestibility of the seeds.

However increasing the speed and intensity of starch in barley grain in rumen make an anxiety about bloat, acidity, liver abscess and limp, And problems in using food on relation with digestive inelegance [8]. Since in fattening units 60 until 70 percent of costs on culturing is about nutrition, so should use suitable methods for increase the output and decrease the production costs through improving managing nutrition and increase digestibility for suction edible items on fattened animals.

This topic also contain the concentration part that usually providing from cereals [6]. Different methods of processing for improve nutrition value exist in grain, especially starch and protein are used, which increase the digestibility and palatability, make destroy weed seed and restrict their reproduction through dung.

Processing barley to break the membrane and pericarp fiber and access to the internal structure of microbial enzymes seems necessary. The purpose of the processing, improving the availability of energy and starch digestion in the rumen, thereby maximizing the amount of carbohydrate [9].

MATERIALS AND METHODS

In order to compare the various methods of hot and cold physical barley processing on fattening lambs feed conversion ratiorage Moghani, 40 male lambs with an average weight of 27/63± 0/746kg of completely randomized design with 4 treatments and 4 repeats on each treatment during 70 days (14 days adaptation period and 56 days during the main experiment) were used. In this experiment, dietary energy level was 5.2 mega-calories per kilogram, CP 14.7 percent, calcium 0.51%, P 0.24% based on NRC-1985 that the food items Alfalfa (34.5%), wheat straw (4%), soybean meal (3.75%), corn (19%), barley (38%), mineral and vitamin supplements (0.5%) and salt (0.25 %), respectively was adjusted to ensure that the chemical analysis of foods used in the experiment were based on NRC -1985.

Treatments include: 1 - The feedlot ration containing whole grain barley without processing, as a control 2 - rations of ground grain (hammer mill and sieve 2 mm) 3 - diets containing wet barley grain (72 hours in usual water) 4 - Diet with ground barley (10 min at 120 ° C), respectively. Feeding lambs was taken in two steps of pre-test (adaptation period) to 14 days and major step 56 days. And during testing lambs in three period, morning, noon and afternoon were fed with mixed rations and the remaining throwing food at each meal and again before the next day was collected and weighed. Also during testing the lambs were given free water and processing characteristics measured such as eatable food, gain weight rate. The data obtained from these experiments (40 samples including 4 treatments and 10 replicates per treatment) in a completely randomized design and were analyzed according to following statistical model. Also the independent comparison between none treatedbarley grain(as a control)with treated grain was done.

$$Y_{ij} = \mu + T_i + \varepsilon_{ij}$$

:Each of experiment observations Y_{ij}

Mean of population μ :

Effect of experimental groups: T_i

ε_{ij} : testing error:

The data were processed with using MSTATC software and comparison means was performed with using Duncan's multiple range tests at the 5% level.

Table 1 - Composition and chemical composition of experimental diets (percent in DM)

Ration of elements	Percent
Hay	34.5
Wheat straw	4
Soybean meal	3.75
Corn	19
Barley	38
Mineral and vitamin supplements	0.5
Salt	0.25
The chemical composition	Metabolic energy (mega calories per kg)
Crude protein (percent)	14.7
Calcium (%)	0.51
Phosphorus (%)	0.24

RESULTS AND DISCUSSION

Table 2 - Average characteristics of feedlot in fed lambs Treatments (diets with different methods of processing barley grain)

characteristic	Full grain (control)	Ground barley seed	Wet barley grain	Parched barley seed
Used dry matter (kg in day)	1.32	1.35	1.38	1.33
Average daily weight gain (g)	211.31 C	212.42 B	251.18 A	213.09 C
Feed conversion rate	6.24 C	6.09 B	5.49 A	6.24 C

* Different letters in each row indicate significant differences at the 5% level.

Experiment results showed that average daily weight gain and feed conversion rate in fed lambs with processed grain had significant difference ($p \leq 0.05$) with control treatment (full grain). Among the various methods available for physical hot and cold treating, wet grain performance in daily weight gain rate and feed conversion ratio significantly ($p \leq 0.05$) was better than other treatments.

Improving weight gain, daily dry matter intake and feed conversion rate of barley under the using different methods of processing the grain are in agreement with the results of some researchers about the physical process of heating and cooling, and the highest yield is about of seed soaking method. Most desirable processing is about reduction of starch resistance to digestive responses as with cutting phenomenal links, proteins shifted to gel state and put it easily in dispose of microorganisms and spattered enzymes of microbe and animal resources [10, 11].

Efficiency and the use of cereals starches may be significantly affected by processing. this action reduce ingredients and also change digestion starch place from gut to rumen, and ultimately increase digestibility rate colon [10].

With attention that the barley grain is major used cereal for energy production in fattened cattle rations, but due to having high fiber its digestibility is lower than other cereals.

The processing of barley grain can be one of the main ways to change and improve its food value, especially starch and protein.

Based on the results of the experiment, among the available methods, soak method (with tap water for 72 hours), have better performance on average daily weight gain and feed conversion ratio in fattening lambs Moghani compared to other races (to grind and parched), respectively.

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