

The Effect of Different Proportions of Ammonification Straw and Sheep Grass on the Fattening Effect of Lambs

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Abstract: In this study, ammonia stems were prepared by high-pressure rapid ammonia treatment system, and the different ratio of sheepgrass and ammonia treatment stems were studied. The impact of daily profits, the livestock industry to promote the large-scale industry, edible fungi, energy, processing industry transformation. We can develop in the direction of commerce and industrialization, thus promoting industrial development. The agricultural structure, and even the whole rural structure, will change and become an important part of the rural economy and a new growth point. The amount of straw was recorded during each feeding, and the remaining amount of straw was recorded before feeding every morning. The daily amount of food was calculated by subtracting the amount of food fed every day from the amount of straw left. This test includes a period of half a month. Body weight of the lambs was measured in the starvation state before morning feeding. Before weighing, we put a big iron rod on the scale and weigh it; The lamb was then placed on a scale and weighed in iron rods. Finally, we remove the track weight from the overall weight to find out the size of each sheep. After the end of the lamb breeding experiment, we calculated the cost of the lamb consumed from the beginning to the end of the experiment in each treatment group, and we calculated the lamb income for each experimental group.

1. Introduction

Straw resource is the most common part of plants in the world. It is a by-product of plant production and a resource that can be comprehensively developed and reused. With the improvement of human attention to the effective use of straw, more and more countries in the world began to pay attention to the use of straw resources. Straw makes modern agriculture replace traditional agriculture, increase agricultural output, promote the sustainable development of ecology, but also provide a large number of materials for agriculture.^[1]

2. An experimental preparation

2.1 Laboratory animals and diet

The sheep used in the experiment came from Longjiang Science and Technology Demonstration

Farm. 16 weaned male lambs aged 4 months were selected, requiring the same age and body size. The sheep were only black-faced Suffolk, and 8 hybrid breeds of northeast semi-fine wool sheep (female). The diet of each experimental group used different proportions of concentrate + aminated straw and alkali grass, and the three were mixed to form the diet with similar nutrient content.(According to the NRC criteria) (see Table 1). Ammonia straw was prepared in a high-pressure ammonia furnace, the ammonia pressure was set to 0.2MPa, and the ammonification time was set to 2 hours. In 2017, straw was packed into cylindrical packets, 8 to 10 packets for each batch, weighing about 10 to 12 kg, totaling about 100 kg. We can leave the treated straws in the storage room for a while until the ammonia smell is completely gone.^[2] Then we use a blade to cut the straw into 1cm and the horseshoe crabs into grass. About 1 cm and then mixed together. Various nutrients of roughage are shown in Table 3).

The concentrated formula was 62% corn, 12% bran, 8% soybean meal, 12% cotton powder, 1.8% stone powder, calcium hydrogen phosphate 1.2%, 1% urea, 1% table salt and 1% premix. The formulation contains 18% crude protein and is 12.94MJ/kg of energy.

Table 1: Nutritional Requieds of Lambs (NRC)

Weight (kg)	daily gain (g/d)	feed intake (kg)	DE (MJ)	metabolizable energy (MJ)	crude protein (g)	Calcium (g)	Phosphorus (g)
20~26	260	1.0	14.64	12.13	167	5.4	2.5
26~32	200	1.2	14.6	12.10	240	6.3	4.4

2.2 Test design

This experiment adopts the experimental design as a single factor, divided into four sheep and four groups of each group was repeated four times. The two breeds of each experimental group have the same number, which is required to be comparable.^[3](Average initial body weight of lambs in each treatment group is shown in Table 3-2), mean daily age difference (initial mean) No significant difference in daily age of lambs in each treatment group (see Table 2). Groups I, II, III and IV lambs were treated with sheepgrass, 26% ammonia treated straw (sheepgrass and 55% ammonia treated). Ammonia straw (76:26) and 55% ammonia straw (straw: 76:26), Table 2 Mean age of lambs in each treatment group.

Table 2: The average age of lamb in each group

	guinea grass	26% ammonification straw	55% ammonification straw	76% ammonification straw
Meverage age (days)	123.26±7.04	124.00±9.42	123.26±4.72	123.76±10.66

Table 3: Nutrient composition of different proportions of amidated straw and sheep grass

group	I	II	III	IV
coarse fodder	guinea grass	26% ammonification straw	55% ammonification straw	76% ammonification straw
DM(%)	90.90	90.82	90.46	90.16
CP(%)	7.85	8.91	9.42	10.21
NDF(%)	64.21	65.32	67.14	68.46

2.3 Feeding and management

All the sheep used in the experiment are kept in the enclosure. The lambs must be disinfected regularly before and before the test, and the lambs must be vaccinated and dewormed immediately after the house.^[4] One ring and one tank (sheep pen size 1m x 1m x 1m), the water dispenser and feeder should be cleaned regularly every day, the sheep pen should also be cleaned every day, the amount of concentrate is the same, roughage should be eaten at will, water should be free, natural light, the room should be well ventilated. We fed twice a day at 8:30 am and 3 PM, adding roughage and 260 grams of concentrate 30 minutes later.

2.4 Test methods

The amount of straw was recorded during each feeding, and the remaining amount of straw was recorded before feeding every morning. The daily amount of food was calculated by subtracting the amount of food fed every day from the amount of straw left.^[5] This test includes a period of half a month. Body weight of the lambs was measured in the starvation state before morning feeding. Before weighing, place a large iron bar on the scale and weigh it. After that, put the lamb on a scale and fix it in the iron bar to weigh it. Finally, we remove the track weight from the overall weight to find out the size of each sheep. After the end of the lamb breeding experiment, we calculated the cost of the lamb consumed from the beginning to the end of the experiment in each treatment group, and we calculated the lamb income for each experimental group. For meat, feed costs are deducted from revenue, and we can compare the profits between treatment groups to find the treatment group with the best financial return.^[6]

2.5 Time and place of the test

The test will be conducted in the Acheng Animal Husbandry Science and Technology Demonstration Park for 67 days, that is, from August 18, 2022 to October 24, 2022, with the pre-test period of 7 days and the main test period of 60 days.^[7] numbers were then statistically analyzed using one-way ANOVA, and when differences between each treatment group were evident, multiple comparisons were performed using the LSD method.

3. Fermentation effect of straw with different amination time in the rumen

3.1 Test animals and diet

Four adult male sheep / hybrid sheep with permanent fistula, weighing about 42 kg, had normal growth and development, good appetite and were healthy and disease-free.^[8] Diets were the same as in experiment.^[8]

3.2 Test design

This experiment used a 44 Latin square experimental design, in which four fistula sheep were fed ammonia-treated straw straw and sheepgrass in different proportions in each period (see Table 4).^[9] The first trial period is 5 days, and the preliminary trial period is 2 days.

Table 4: Test design

	No.1 sheep	No.2 sheep	No.3 sheep	No.4 sheep
tranche	guinea grass	26% ammonification straw	55% ammonification straw	76% ammonification straw
the second phase	26% ammonification straw	guinea grass	76% ammonification straw	55% ammonification straw
The third phase	55% ammonification straw	76% ammonification straw	26% ammonification straw	guinea grass
the fourth phase	76% ammonification straw	55% ammonification straw	guinea grass	26% ammonification straw

4. Feeding and management

4.1 Test side fistula sheep

Before the experiment, the vaccine must be vaccinated, the drug is cleared, and it must be kept in a single tank and single shed. We can feed twice a day, at 8:30 in the morning and 15 in the evening, and freely drink water, each time the concentration of water is about 260 grams.^[10]

During the formal study period, 1,3 and 6 hours before feeding, a homemade negative pressure sampler (100 nylon mesh) was tested through the rumen.30ml of single gastric juice, immediately fully shaking, pH with a portable acidimeter, centrifugation at 4000rpm for 10min, 101% trichloroacetic acid 2:1:1 (rumen fluid: metaphosphoric acid metapophosphoric acid and 2 drops of mercury chloride, immediately 20°C cold storage, cold storage for subsequent analysis to determine the VAF concentration in ruminal fluid.^[11]

4.2 The time and place of the test

The trial was conducted on 23 August 2022 — 10 December 2022.

4.3 Data statistics

Table 5: Test design

	No.1 sheep	No.2 sheep	No.3 sheep	No.4 sheep
tranche	1(i)	2(i)	3(i)	4(i)
the second phase	2(i)	1(i)	4(i)	3(i)
	No.1 sheep	No.2 sheep	No.3 sheep	No.4 sheep
The third phase	3(i)	4(i)	1(i)	2(i)
the fourth phase	4(i)	3(i)	2(i)	1(i)

Note: ① 1,2,3 and 4 represent nylon bags with sheepgrass, 26% ammonified straw, 55% ammonified straw and 76% ammonified straw respectively.

Same as in trial 1.

The degradation rate of straw in the rumen with different ammonification times, test animals and diet Same as in Test 2.2.

(3) 2. Test design

The experiment was performed following the 4x4 Latin experiment design (see Table 5) and repeated with three nylon bags for each feed type.

② (I) represents several different time points.

(3) 3. Breeding and management

Same as in Test 2.2.

(3) 4. Test methods

Different proportions of ammonia treated straw and horseshoe crab samples were dried at 65°C, crushed, screened through 40 mesh, and loaded into nylon bags. Each bag weight of 3.0 g nylon bags was made of mesh nylon fabric, nylon bags size of 20100mm rectangular, and multiple bags were connected with rope series. One treatment agent was injected into the rumen for a total of 4 times. According to the principle of "put in and take out at the same time", the nylon bags were put into the rumen 6,12,24,48 respectively. And they were cultured for 72 hours. Nylon bags at 20:00 on the first day, 20:00 on the second day, 20:00 on the third day, 8:00, 14:00,20 points out: 00. Night. After removing the nylon bag from the rumen, it was rinsed with cold tap water to remove any residue of the rumen contents and the surface of the nylon bag, and to prevent microbial activity. Then, when soaked in cold water for 56 min without adding detergent, dried, and rinsed, the nylon bag was dried in a 65°C oven to constant weight. Then crush the residue in the dried constant weight nylon bag (through a 1 mm screen) and put it into the sample bottle to measure DM, CP, and NDF values (see Appendix B). The breakdown rate is calculated as follows: DM decomposition rate of the straw to be measured at a certain point = (DM mass in the bag before decomposition-DM mass in the bag after decomposition) / 100% of the DM mass in the bag is 100%; NDF decomposition rate of the straw at a point to be measured = (NDF mass in the bag before deterioration-NDF mass in the bag after deterioration) / NDF mass in the bag is 100%

(Iii) 5. Test time and place

The experiment was conducted on August 23, 2022—on September 10, 2022 in Longjiang Sheep Farm, Qiqihar City, Heilongjiang Province.

5. Four conclusions

With the increase of the proportion of ammonification results, the daily feeding amount of lambs showed a decreasing trend, and the difference between alkali grass group and 26% ammonification straw group was not significant. There were significant differences between the two groups, but the differences between the 55% ammonified straw and the 76% ammonified straw group, and the 76% ammonified straw and the alkali grass group were obvious, with the lowest daily feed intake.

Fending effect of young lambs:

The alkali grass group had the highest daily weight gain, and the 26% ammonified straw group was the lowest in the 76% ammonia treated straw group. There were significant differences between the grass group and 26% ammonified straw group and 55% ammonia straw group and 76% ammonified straw group, and the difference was not obvious. Significant differences were observed. The first two groups were significantly different from the latter two groups.

The high-pressure steamed ammonification straw significantly improved the decomposition rate of DM, NDF and CP in the rumen, and with the increase of the input content of ammonification straw, the digestion rate of DM, NDF and CP also increased or decreased, and the rate increased. CP increase. The NDF and the CP will also increase. During the rumination process, the NDF and CP increase, and the digestion time of DM, NDF, and CP is accelerated.

The effects of the feeding group on PH, NH₃-N, and VFA in each group were universal values, showing clockwise changes. After feeding, 3. The pH decreased for 5 hours and then slowly rose to pre-feeding levels.

This time, the alkali grass group was added the most, with good economic feedback, and the 26% ammonification straw group was ranked in 2. It can be used as a range. Then, in order to achieve maximum economic feedback, we can pre-test a 26% ammoniated straw group.

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