Iran. J. Agric. Res. Vol. 6, No. 1, pp. 65–68 0363–1307/78/0601–0065$02.00/0

NOTE

BROILER-HOUSE LITTER AS A FEEDSTUFF FOR CATTLE IN KHUZESTAN[1]

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Abstract – Sun-dried, ground broiler-house litter (BHL) was fed in rations to growing bulls to evaluate their energy values in comparison to control rations without BHL. Ten bulls per pen were used. A ration with 30% BHL was compared to another ration with similar protein and crude fiber contents. Both were fed free-choice. Bulls ate less of the BHL ration and gained less weight than those fed on the control ration. In a second trial, 14% BHL was added to a base ration fed to both groups in equal quantities. One-half per cent urea was added to the basal ration of the control group. Weight gains were equal for both groups. It was concluded that the BHL used in these trials contained very little energy available to ruminants. It may have contributed useful crude protein but this was not investigated critically.

INTRODUCTION

Broiler-house litter (BHL) has value as a feed for ruminants [2–6]. It is variable in composition depending upon source and amount of bedding, conditions during accumulation and treatment before feeding [2, 4, 5].

The objective here was to evaluate BHL as an energy source for growing bulls when rice hulls were used as the starting litter and the material was accumulated for 60 days and then sun dried before use.

MATERIALS AND METHODS

BHL was accumulated under broilers for 60 days, was then removed, sun dried and ground in a hammer mill. It contained 6.5–8.3% water and the dry matter (DM) contained 15.7–22.4% crude fiber, 16.4–18.8% crude protein and 22.5–34.0% ash. The litter was based on rice hulls.

Two feeding trials were conducted using 20 bulls of Holstein and Brown Swiss breeding. Two groups each containing 10 bulls of the same average weight were assigned

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randomly to each ration. Bulls were relotted, half from each lot being exchanged, for the second trial. For the first trial, a ration with 30% BHL was compared to another without BHL. Both rations were fed in measured quantities to satisfy appetite. Ration compositions are shown in Table 1. It was intended that both be similar in regard to crude fiber and protein. However, the BHL ration contained less, but included an adequate amount of protein [1], somewhat less crude fiber and the ash content was considerably higher than in the control ration. For the second trial, both rations contained equal quantities of all ingredients, except that the control ration contained 0.5% urea and the BHL ration contained 14% BHL. The BHL ration was fed to appetite and the other was restricted to 86% as much to provide an equal amount of the basic mix to both groups. Bulls were fed once daily at about 6.30 a.m. Twelve hours before feeding, molasses were added to the dry beet pulp with a quantity of water equal in weight to the beet pulp. Most of the hay for the first trial was chopped into pieces from 5–10 cm in

Table 1. Data comparing rations with and without broiler-house litter for growing bulls

Item	Trial and ration used			
	I		II	
	Control	BHL*	Control	BHL
Initial age of bulls, months	9.5	9.6	12.5	12.6
Initial weight (kg)	208	209	277	278
Days fed	90	90	120	120
Average daily gain†, kg/day	0.919	0.771	0.716	0.701
Ration:				
Constituents, % of whole				
Broiler-house litter	–	30	–	14
Rice bran with added hulls	20	–	12	10.2
Molasses, cane	32	28	26.8	23.6
Beet, pulp	15	15	26.7	23.2
Hay‡	5	10	20.4	17.9
Barley	12.5	7.5	–	–
Wheat	12.5	7.5	11.6	9.3
Urea	1	–	0.5	–
Salt	1	1	1	0.9
Bonemeal	1	1	1	0.9
Composition of dry matter, DM				
Crude protein (%)	13.1	11.3	11.9	11.2
Crude fiber (%)	12.5	11.8	–	–
Ash (%)	10.8	15.8	10.4	13.0
DM, Mcal NE/kg	1.467	–	–	–
Consumption				
kg/bull/day	8.44	7.60	7.91	8.99
kg DM/bull/day	7.34	6.68	6.99	7.98
kg/DM/kg gain	7.99	8.67	9.76	11.38

*BHL, broiler-house litter.

†Determined by regressing body weights against days on trials.

‡Mostly mediocre-quality alfalfa hay, for a short period green chop was fed and the quantity expressed as hay equivalents.

length. For the second trial, 60% of the hay was finely ground (approx. 1.0 cm) and the rest was left uncut.

Rations were evaluated by the growth rate of the bulls. Weight gains were measured by regression of full weights recorded each 15 days against days on trial. Bulls were weighed before the feed was fed in the morning. The first trial lasted 90 days, the second 120 days. The net energy (NE) of BHL was estimated by subtracting the NE consumed in other ration ingredients from the NE needs of the bulls calculated from a feeding standard used for steers. For this estimate it was assumed that bulls and steers had similar energy needs for equal size and rate of gain. A second estimate was based on the possibility that these bulls required more energy than the steers used to derive the energy needs shown in the standard [1].

RESULTS AND DISCUSSION

The results of the feeding trials are shown in Table 1. In the first trial bulls ate more of the control ration, gained 148 g more daily weight and ate less feed per unit of gain than bulls fed BHL ration. Daily gain among animals within groups was highly variable so the difference of 148 g per day was not statistically significant at the 5% level.

From information on energy requirements and the energy values of feedstuffs [1], it was possible to estimate the energy content of BHL. NE required for maintenance and weight gain by bulls fed the BHL ration was 7.90 Mcal daily. This estimate was based on requirements for steers [1] as data were not available for bulls. The NE consumed, disregarding the BHL, amounted to 7.76 Mcal daily. The bulls consumed 2.118 kg BHL DM daily. The BHL had a value of 0.066 Mcal NE/kg of DM which was very low compared to values reported [2]. This value may be incorrect. The control bulls required 8.94 Mcal NE, yet consumed an estimated 11.72 Mcal NE. This discrepancy of 2.78 Mcal (31%) between estimated energy need and estimated energy intake may be caused by bulls requiring more energy than steers of the same weight gain, by the ration being used less efficiently than expected, or by some combination of both. If it is assumed that the bulls fed BHL also required 31% more energy than required for the performance recorded, the value of BHL DM would be 1.222 Mcal NE/kg DM. Such a value is similar to values reported from digestibility trials [2]. Further work is necessary to evaluate BHL as an energy source.

The second trial was designed in the fashion of a negative control vs an experimental ration to determine the specific effect of an addition of BHL to a base ration used for both groups. The addition of 1.16 kg of BHL DM to the basal ration was without effect on weight gain. The bulls fed the basal ration with 40 g urea gained 15 g per day (statistically insignificant) more than those fed BHL (Table 1). It was concluded that the BHL used in these trials had little or no NE value for growing bulls. Previous work indicated that BHL had an energy value equivalent to mediocre hay [2]. In a recent study [4] steers gained in excess of 1.0 kg daily on a corn-based ration including 20% BHL using either wood shavings or peanut hulls. This compared favorably to gains made on the control ration which included peanut hulls. The BHL used here contained considerably more ash than those reported [2, 4], indicating less usable organic matter as an energy source. Whether the nitrogen in BHL has value as a crude protein source was not

investigated critically in these trials, although it may be implied from the second trial that 40 g urea was equivalent to 1.16 kg BHL.

Acknowledgments – The authors wish to give credit to Mohammad Ali Adie, Feed Technician, Livestock Department, for technical assistance and to the Analytical Laboratory, Safiabad Research Center for feedstuffs analyses.

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