A COMPARISON OF WET MASH AND DRY MASH FEEDING FOR BROILER FINISHER DURING WET SEASON IN THE TROPICS

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ABSTRACT

An experiment was conducted to compare wet mash and conventional dry mash feeding for finisher broilers. Feed intake, live-weight gain, feed efficiency and weights of heart, crop, and abdominal fat deposit were significantly ($P < 0.05$) higher in broilers receiving the wet mash. Water intake and gizzard weight were significantly ($P < 0.05$) higher in birds fed dry mash. No significant ($P < 0.05$) differences were observed in dressing percentage, weights of liver, intestine and the proventriculus. The results of this experiment demonstrated that wet feeding is not deleterious to the performance of broilers in the tropics. It also concluded that wet feeding is desirable not under hot weather conditions alone, but also during the rainy season.

Keywords: Wet mash, Dry mash, Diet, Performance, Broiler Finishers, Organ weights.

INTRODUCTION

Conventionally, commercial poultry birds are fed dry mash and offered drinking water separately. Hitherto in traditional poultry keeping in Great Britain wet mash was known to be given to birds. Earlier comparisons between the use of dry and wet mash (Robinson, 1948) did not show that any advantage can be derived from wet feeding. Infact it is even more laborious to feed wet mash than dry mash. However, more recent studies (Yalda and Forbes, 1995; Coskun and Kutlu 1997; Abasiokong, 1989) point to the tendency that wet mash may be more

advantageous than dry mash in poultry feeding. Similar findings have been reported in growing pigs (Brooks and Carpenter, 1990; Rayner and Miller, 1990).

According to Yalda and Forbes (1995), food intake, body weight gain and carcass weight were significantly increased for all water additions compared with dry feed, but there were no significant differences between different water additions in broilers. Using cockerels of an egg laying strain these authors reported that wet feeding did not increase their intake of dietary dry matter but there was a significant increase in body weight gain. Similarly, Abasiokong (1989) showed that feeding broiler chickens on a wet diet with the addition of 0.33 or 0.50 water increased both feed intake and body weight in the hot season (37°C), however, food intake and body weight were reduced significantly at normal temperatures. Generally, in the tropics high environmental temperatures are of major concern to broiler producers. Reduction in the performance of broilers at high ambient temperature may occur because the birds reduce their feed intake to avoid the thermogenic effect of the feed ingested (Coskun and Kutlu, 1997). Kutlu *et al.* (1995) reported that diet with more than 60% moisture increased performance of broilers under heat stress conditions.

Most of the research work cited above used individually fed, caged birds. In Nigeria broilers are mostly reared on deep litter and group-fed. This experiment was therefore conducted using finisher broilers raised on

deep litter. The experiment was also conducted in the rainy season between June and July. The objective was to know whether wet feeding will confer any advantage or disadvantage on broiler production in a wet season under tropical conditions.

MATERIALS AND METHODS

Fifty broiler chicks of Anak 2000 breed were collected at day old. They were raised on deep litter and fed on a proprietary broiler starter. Birds were vaccinated against Newcastle and Gumboro diseases. Prophylactic antibiotic therapy of Aserly(R) was administered in the first week of life. Biovit(R) was also used as an anti-stress. At 4 weeks of age, their diet was changed to a broilers finisher containing 2908 kca/kg ME, 19.45% crude protein, 4.16% ether extract, 4.27% crude fibre, 1.2% Ca and 0.53%P.

At four weeks of age, thirty birds whose weights were very close were selected from the remaining forty-six birds. A mortality of four birds had been recorded in the first four weeks. The birds were divided into two groups of fifteen each and these were further subdivided into two replicates of seven and eight birds each. Each replicate was reared in a deep litter house and a floor space of 0.9m²/bird was maintained throughout the experiment which commenced at the end of the fourth week and ended when the birds attained nine weeks of age.

The first group was fed the conventional dry mash with drinking water *ad libitum*. The second group was fed wet mash (1 part of feed to 1 part of water) with drinking water *ad libitum*. The wet mash was prepared at the time of feeding. Feeding was done twice daily. The birds were on the same finisher diet.

Daily feed and water intakes were measured. Weekly body weight gains were also recorded. At nine weeks of age, the birds were deprived of feed but allowed access to drinking water for 18 hours. Six birds whose weights were close to the means of each treatment group were sacrificed and eviscerated. The internal organs; liver, gizzard, heart, intestine, crop, proventriculus and abdominal fats were weighed and expressed as percentage of live-weight. The dressing percentage was also calculated.

The data collected were subjected to a paired-T-test comparison (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

Data for liveweight gain, feed intake, feed conversion efficiency, water intake and mortality are summarised in Table 1. All these measurements except mortality were significantly ($P<0.05$) different between the two treatments. Feed intake and weight gain were significantly ($P<0.05$) higher in birds fed wet mash.

TABLE 1: MEAN LIVE PERFORMANCE OF BROILERS FED DRY AND WET MASH

MEASUREMENTS	DRY	WET	SEM
Initial weight (kg)	0.8719 ^a	0.8612 ^a	0.00732
Feed intake (kg)	3.0400 ^b	3.3125 ^b	0.0626
Water intake (l)	5.4412 ^a	5.0229 ^b	0.0448
Weight gain (kg)	0.7033 ^b	0.9200 ^a	0.0169
Feed Conversion Efficiency	0.23 ^b	0.25 ^a	0.009
Mortality	0.00	0.00	

SEM: Standard error of means

¹Means in the same row with different superscripts are significantly different ($P<0.05$)

WET FEED FOR BROILERS

Birds receiving the wet mash also showed a significantly ($P<0.05$) superior performance in terms of feed efficiency. These findings agree with that reported by Yalda and Forbes (1995) and also Abasiokong (1989). Although in the work of Yalda and Forbes (1995) the proportion of water added was higher, the same authors reported that the amount did not matter provided it was not less than 0.75 parts to a part of feed. The possible effects of wet feeding are increased activation of endogenous enzymes (Fry *et al.*, 1958), increased dry matter and protein digestibility (Yalda and Forbes, 1995) and induced hyperphagia as observed in rats (Ramirez, 1991).

Water intake was significantly higher ($P<0.05$) in birds receiving the dry mash compared with those on the wet mash. This implies that an appreciable part of their water requirement has been met by the wet mash. Yalda and Forbes (1995) had earlier reported that birds given wet mash without drinking water compared favourably with those with drinking water. According to them the provision of drinking water does not confer any advantage on the use of wet mash. No mortality was recorded during the experimental period.

The results of the carcass yield and organ weights are shown in Table 2. No significant differences ($P<0.05$) were observed in the carcass yield of broilers. This agrees with the observation of Coskun and Kutlu (1997). However, it is contrary to the findings of Yalda and Forbes (1995) who observed significantly increased carcass yield in birds fed wet mash. Abdominal fat deposit was significantly higher ($P<0.05$) in birds fed wet mash. This agrees with the reports of earlier researchers (Yalda and Forbes, 1995; Coskun and Kutlu 1997) who observed increased abdominal fat weight in birds fed wet mash. However, with female broilers Yalda and Forbes (1995) reported no significant differences in abdominal fat deposition. The birds used in this experiment are of a mixed sex. Gizzard weight in this experiment was shown to be significantly ($P<0.05$) higher in birds fed dry mash. It is most probable that increased muscular activity was required for the grinding of the dry mash hence the hypertrophy of the gizzard. Liver, spleen, proventriculus and intestinal weights were not significantly ($P>0.05$) different between the two treatments. The crop of the birds on wet

TABLE 2: MEAN CARCASS YIELD AND ORGAN WEIGHTS (EXPRESSED AS % LIVE WEIGHT) OF BROILERS FED DRY AND WET MASH

MEASUREMENTS	DRY	WET	SEM
Live weight (kg)	1.58	1.78	
Dressing (%)	67.57 ^a	68.13 ^a	0.95
Abdominal fat (%)	1.65 ^b	2.45 ^a	0.22
Liver (%)	2.34 ^a	2.50 ^a	0.12
Gizzard (%)	2.30 ^a	2.04 ^b	0.09
Intestine (%)	3.15 ^a	3.96 ^a	0.51
Heart (%)	0.39 ^b	0.44 ^a	0.02
Crop (%)	0.32 ^b	0.41 ^a	0.02
Spleen (%)	0.13 ^a	0.12 ^a	0.01
Proventriculus (%)	0.42 ^a	0.39 ^a	0.03

SEM: Standard error of means

*Liveweight data used to express the organ weight as percentages.

Means in the same row with different superscripts are significantly different ($P<0.05$)

mash was significantly bigger ($P<0.05$) than those on dry mash just as reported by the other authors. The increased capacity and hence weight of the crops must have been due to the increased feed intake. Heart weight was significantly bigger ($P<0.05$) in birds fed wet mash. No immediate explanation can be adduced for this increase.

The results of this experiment showed that wet feed is superior to dry feed for broiler finishing, not only during hot weather conditions but also in the rains. The significantly increased ($P<0.05$) live-weight gain is advantageous especially where birds are marketed life.

It will be interesting to examine higher levels of water addition and also to compare wet feed with and without drinking water, both for starter and finisher broilers. Since this experiment has demonstrated that wet feeding is not deleterious to broilers under tropical condition, it is believed that broiler production in the tropics will be able to benefit from any technology developed to deliver, effectively, wet feed for poultry.

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