

## Effects of Wet Feeding on Growth Performance and Visceral Organ Weights of Broiler Chicken under Two Day-Time Ambient Temperature Levels

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### Abstract

High ambient temperature reduces the feed intake, nutrient digestibility and performance of broiler chicken. Wet feeding increases the feed and water intake with beneficial effects on growth performance. Objective of this study was to determine whether adverse effects of high ambient temperature on broilers could be mitigated by wet feeding. Giving a completely randomized design in 2 x 2 factorial arrangement, 48 broiler chicks in 24 floor pens and subjected to ambient or ambient + 2°C day time temperature were fed a commercial finisher diet either in dry or wet form. Increase of the ambient temperature by 2°C did not reduce the feed intake or growth performance parameters. The relative weight of gizzard and proventriculus and the relative length of the small intestine were lower at higher ambient temperature. Wet feeding increased the total water ingestion (with feed+from drinkers) and the water:feed ratio. Temperature x feed interaction was significant for feed intake. When given in dry form, feed intake reduced at high ambient temperature, compared to lower ambient temperature. Whereas, when given in wet form, feed intake of the birds kept at higher ambient temperature was not significantly different from that of the birds at lower temperature. Feed conversion ratio (FCR) of the birds given wet feed was tend ( $p=0.06$ ) to be better than that of the birds given dry feed. It was concluded that wet feeding mitigates the adverse effects on high ambient temperature on feed intake and improves the feed efficiency.

**Key words:** Ambient temperature, Feed intake Water intake Wet feeding

### Introduction

High ambient temperature levels produce a cascade of adverse effects in poultry. Since heat dissipation mechanism of poultry is poor, high ambient temperature levels reduce the feed intake to minimize the metabolic heat production. The digestibility of nutrients and the endogenous losses of the nutrients are also increased at high ambient temperature levels. Mainly due to above reasons, performance of broilers kept at high ambient temperatures are low (Syafwan et al. 2012). Above adverse effects of high temperatures are even severe under poor management condition and high RH conditions. In this context, strategies to mitigate the adverse effects of high ambient temperatures on broilers are of importance.

As reviewed by Forbes (2003), wet feeding increased the feed intake, nutrient digestibility and growth performance of broiler chicken. Atapattu and Wickramasighe (2008) showed that the total ingestion water of the broilers given wet feed was higher than

those given dry feed. Since water is important to alleviate the heat stress conditions as well, it was hypothesized that adverse effects of high ambient temperature on broilers could be mitigated by wet feeding. The objective of this study was to test the above hypothesis.

### Materials and methods

Broiler chicks were managed under standard condition until day 22. On day 22, 48 birds were allocated into 24 floor pens so that live weight variation between pens was minimum. Pens were randomly assigned into completely randomized design in 2 x 2 factorial arrangement. Treatment factors were two day time ambient temperature levels (ambient temperature and ambient + 2°C) and two feed forms (dry or wet). Temperature of the ambient + 2 pens was adjusted by fixing incandescent bulbs. Night time temperature was not adjusted. Mean day time temperature during the experimental period was 31°C. Wet feed was prepared daily by mixing same dry feed

(CIC Feed, broiler finisher) with tap water at 1:1 ratio. Three wet feed containing feeders were kept outside pens and the mean evaporation loss of water from those feeders were used to adjust the feed intake of wet feed given birds. Feed and water were given ad libitum from 23-38 d. One randomly selected bird from each pen was killed on day 39 to determine the weights of the crop, pancreases, gizzard, proventriculus, cloacal fat and length of the small intestine. Data were analyzed as a completely randomize design in 2 x 2 factorial arrangement. Significant main effects were compared using DMRT procedure while significant interactions were compared using LS mean comparison procedure.

effects of high temperature on performance are attributed to above changes in the digestive tract. Probably due to the intake of water with feed, water intake from the drinkers reduced when wet feed was given. However, the total water ingestion (with feed +from drinkers) and the water: feed ratio were increased due to wet feeding.

comparison showed that when given in dry form, feed intake reduced at high ambient temperature, compared to lower ambient temperature. Whereas, when given in wet form, feed intake of the birds kept at higher ambient temperature was not significantly

**Table 1: Growth performance parameters and feed and water intakes of broilers chicken as affected by two day-time ambient temperature levels and two dietary forms**

Temperature	Feed	Live weight (g)		Weight gain (g)	Feed intake (g)	FCR	Water intake (ml) (drinkers)	Water intake (ml) (total)	W:F Ratio (total)
		23 d	38 d						
Ambient	Dry	799	1769	969	1796	1.86	4545	4545	2.5
	Wet	778	1920	1142	1479	1.33	3302	4782	3.2
Ambient + 2°C	Dry	772	1769	995	1708	2.05	4188	4188	2.4
	Wet	760	1744	983	1507	1.54	3358	4866	3.2
SEM		6.3	39	40	29	0.13	128		
Main effects									
Temp	Amb	788	1850	1062	1626	1.57	3876	4673	2.89
	Amb +	766	1756	990	1607	1.80	3773	4527	2.83
Feed	Dry	786	1769	982	1752	1.96	4368	4821	2.4
	Wet	770	1839	1069	1492	1.43	3328	4367	3.2
Probability									
Temperature		NS	NS	NS	NS	NS	NS	NS	NS
Feed		NS	NS	NS	**	NS	**	**	**
Tem*Feed		NS	NS	NS	*	NS	NS	NS	NS

\*, P<0.05; \*\*, p<0.01; NS, P>0.05

### Results and Discussion

Contrary to Syafwan et al. (2012) high ambient temperature did not reduce the feed intake or growth performance parameters (Table 1). In the present experiment, the ambient temperature was increase only by 2°C. Therefore, the magnitude of temperature rise might not have sufficient enough to evoke negative effects. Non-significant effect of high temperature on water intake supports this assumption. The relative weight of gizzard (2.0%) and proventriculus (0.46%) and the relative length of the small intestine (13.4 cm/100 empty carcass weight) of the birds at high ambient temperature were lower than those at low temperature (2.3%, 0.61% and 14.8cm/100 g, respectively). Leksrisompong et al. (2007) have reported similar effects in chicken embryos. Further research are needed to determine whether adverse

different from that of the birds at lower temperature. Even though the higher temperature had only a numerical negative effect on feed intake, above observation suggest that wet feeding mitigates the negative effect of higher temperature on feed intake.

Suggesting that wet feeding improve the nutrient digestion and/or utilization efficiency, the FCR of the birds given wet feed was tend to be (p=0.06) lower than that of the birds given dry feed. Positive effect of wet feeding on feed efficiency have reported by Forbes (2003) has also reported positive effect of wetting, particularly of poor quality feeds on feed efficiency. Use of relatively good quality commercial feeds in this experiment may be the reason for less pronounced effect of wetting on feed efficiency.

It was concluded that wet feeding mitigates the adverse effects on high ambient temperature on feed intake and improves the feed efficiency. High ambient temperature negatively affects the growth of the proventriculus, gizzard and small intestine.

#### **References**

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