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Effect of famotidine (histamine H2-receptor antagonist) on food and water intake in broiler chickens in a state of hunger and satiety

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ABSTRACT

The role of histamine in the regulation of food and water intake in mammals and birds of the review, this study evaluated the effects of intraperitoneal administration of famotidine as histamine H2 -receptor antagonist, in broiler chicks on feed intake and satiety in water and was hungry. 32 male Ross broiler chicks reared in groups of four weeks, 16 samples (control and test) were then injected with 0.5 ml famotidine (level 2.5 mg per kg of body weight) intraperitoneally , taking feed and water the chickens at intervals of 15 , 30, 45, 60, 90min and 2 , 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 21, 23h after injection the control group was weighed and recorded .Results showed that famotidine injection in chicks fed at 30 , 45, 60, 120, 1260 and 1380 min after injection caused a significant reduction ($p < 0.05$) in feed consumption .Famotidine had no significant effect on feed intake in starvation mode. Conclusion: According to these results, it seems that the histamine receptor H2, feed and water consumption of poultry (broiler) does not work.

Keywords: Broiler, feed intake, hunger and satiety, famotidine, histamine H_2 receptor

Introduction

Animal feed intake and energy balance is an important issue in Applied Physiology.Using a variety of techniques, different mechanisms controlling feeding behavior have been discovered. Many of the molecular mechanisms controlling symptoms of the central nervous system, such as glucose, triglycerides, leptin, insulin, Mylyn, Antrvastatyn, Guerlain and are Cholecystokinin. The turn signal transmitters in the central nervous system, such as neuropeptide Y, MSHα, IL-1, Glutamate, dopamine, norepinephrine, serotonin, GABA, Acetylcholine and histamine are regulated (Prell et al., 1986). Histamine is a neurotransmitter in the brain, its physiological effects on target cells by stimulating receptors in three categories , including receptors H_1, H_2 and H_3 located in the cytoplasmic membrane is applied (Black et al., 1972 and Brown et al 2001). Inhibition or activation of these receptors in many brain regulatory functions , including sleep and

wakefulness, brain stimulation, etc. that affect cardiovascular activity (Babapour et al., 1999). The central control various aspects of feeding behavior, food and water intake values (Lecklin et al.,1998) and Tamaddonfard et al.,1999 and Fujise et al., 1998) fusion activity, food intake and eating rate (Doi et al., 1994) and circadian rhythm of food intake and water (Lecklin et al., 1998) and Machidori et al., 1992) Sets . Within the prescribed Hsytamyn brain , feed the animals , goats, cattle and broiler chickens reduced (Meade et al., 2001 and Tuomisto et al., 1979 and Gay et al., 2003). In some experiments, intraperitoneal injection of histamine reduces food intake in rats (Attoub et al., 2001 and Kuenzel et al., 1994) .Histamine is also considered one of the most important factors that influence drinking behavior has been identified in mice (Tamaddonfard et al.,1999). But intracerebral injection of histamine in broiler chickens had no effect on drinking behavior (Tuomisto et al., 1979). Despite the very extensive research in this field has been done in recent decades but is still a lot unknown about how to get the optional feed via histamine receptors (H_1, H_2 , and H_3) there. More information about the regulation of appetite , nervous Mammals of research results in the rat. Because the nerve centers of the brain that regulate food intake in mammals are at low levels (medulla oblongata, cerebral and Dyansfal Bridge) So it seems that regulates appetite in mammals and birds by similar mechanisms (Cabrera et al., 2006). However, anatomical differences Between birds and mammals can also be effective mechanisms that regulate food intake. Nutritional status, duration of starvation and the relationship between water consumption and animal feed could be used as one of the factors that may affect the responses of animals to be considered (Masaki et al., 2004). The animal's response to a given type (intracerebral or intraperitoneal) can also be considered. Furthermore, strategies to increase feed intake in order to increase production and reduce food intake in order to Broilers management there (Sakata et al., 1998) One of these solutions is the use of histamine H_2-receptor antagonist famotidine as. The aim of this study was to evaluate intraperitoneal administration of famotidine in nutritional status of satiety and hunger, feed and water consumption of broiler chickens.

Materials and Methods

In this experiment,32 male Ross broiler chicks up to 4 weeks at University of Ilam Hall Farms as a group to keep food and water freely available were. In the first week of rearing temperature was 31-32° C and 3.2 ° C per week, raising the temperature was decreased. After 4 weeks the chicks in the control group and the experimental group consisted of 16 chicks each were assigned. In the experimental group, the amount of famotidine 5.2 mg per kg of body weight and the amount of saline 0.5 mL was injected intraperitoneally to chicks. Feed consumption per chick at intervals of 15, 30, 45, 60, 90min and 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 21, 23h after injection and weight was recorded in the control group. 1ml of water was also used to calibrate the drinker. In the first 24 hours of the experiment, chickens were fed and starved chickens were the second 24 hours of data were recorded in the two time periods.

Data on repeated measures design in time was analyzed using SAS statistical software was used for statistical comparison test Lsmeans.

Results

Effect of famotidine injection in broiler chicks on feed and water intake compared with the control group in Table 1 and 2 is shown. The results showed that famotidine injection in chicks fed at 30, 45, 60, 120, 1260 and 1380 min after injection caused a significant reduction ($p < 0.05$)

in feed consumption. Famotidine in Starvation had no significant effect on feed intake. Famotidine Injection Water Use hungry chicks at 45, 60, 90 and 120, both starved and fed chicken from 240 to 1380 min after injection compared with the control group significantly increased ($p < 0.05$).

Discussion

H2 receptor antagonist famotidine injection results showed that as Histamin in chicks fed at 30, 45, 60, 120, 1260 and 1380 min after injection caused a significant reduction ($p < 0.05$) in feed intake, but the state starvation had no significant effect. The results (Lecklin et al., 1998) the effect of famotidine injection on feed intake, respectively. Rabbit and mouse studied, was consistent (Tamaddonfard et al.,1999 and Baldwin et al., 1995). Given that histamine reduces food intake in broiler chickens (Ebenezer., 1992 and Ebenezer et al., 1999), it appears that histamine H2 receptors in both satiety and hunger is not involved in feed intake.

Histamine H2-receptor antagonist famotidine injection as water intake in hungry chicks at 45, 60, 90 and 120, both starved and fed chicken from 240 to 1380 min after injection compared with the control group significantly increased significantly ($p < 0.05$). Histamine is a factor influencing the Bnvshy circadian rhythm in rats and ruminants (Morimoto et al., 2001). The results of the experiments showed that intracerebral injection of histamine causes increased water consumption in the animals (Hironobu et al., 2006 and Mollet et al., 2006) Therefore, it seems that Hsytamyn H2 receptor is not involved in water consumption in broiler chickens.

In feed intake, and feed the hungry chicks, there was no significant difference in response to the results of famotidine Cabrera (Cabrera et al., 2006) looked at the effects of histamine, was consistent (Masaki et al., 2004) (Tables 1 and 2). In one experiment, the chicks were 8 days with two days of starvation, the rate of digestion passage markers in Chynhdan chicks hungry an hour after injection, compared with the control group (Tur et al., 1985). Therefore the difference between feed and water the chickens to feed the hungry and password Chynhdan fast food of the hungry chicks communication. Changes in gastric tube feeding because of the limitation period - Rivers of the enzymes and hormones (Hakanson et al., 2001 and Schayer et al., 1957). The results of the water and feed the hungry chicks famotidine there were significant differences in response to increased feed intake, water intake also increased (Table 1 and 2) with the results, were consistent Histamine and its antagonists injected intraperitoneally pork and showed an increased water intake increases. This phenomenon appears to be regulated by different mechanisms, including the release of angiotensin and histamine (Kalra et al.,(1999

The results showed that the histamine H2-receptor inhibition and increased feed intake in broiler Bnvshy histamine is caused by interference does not seem to regulate food intake and water can affect other receptors that could be the subject of further research.

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Table 1 - Average daily feed intake and feed the hungry chicks in groups administered with famotidine

P>t) Famotidin(		Famotidin		Witness		
Hunger (gr)	Satiety (gr)	Hunger (gr)	Satiety (gr)	Hunger (gr)	Satiety (gr)	Time (Min)[1]
4754.0	8151.0	83.2	37.2	0	0	15
9316.0	8918.0	83.5	3	37.0	5.2	30
0071.0	3952.0	33.11	25.3	62.0	37.6	45
0071.0	1179.0	33.11	8.3	62.0	62.9	60
0053.0	8383.0	83.12	25.10	75.1	11	90
0043.0	8383.0	18	37.12	62.6	62.11	120
0817.0	2476.0	66.35	37.18	75.28	12.14	180
0006.0	0323.0	83.47	75.24	25.34	87.16	240
0027.0	0528.0	6.58	5.28	25.46	37.21	300
004.0	0035.0	33.64	34	12.53	25.23	360
0001.0	0039.0	16.72	87.37	5.55	25.27	420
0001.0	0044.0	66.77	12.42	87.59	62.31	480
0001.0	0049.0	83.81	50.48	65	12.38	540
0001.0	0008.0	83.84	62.52	50.66	75.41	600
0001.0	0002.0	33.87	50.60	62.69	75.46	660
0001.0	0020.0	5.88	62.62	87.70	25.51	720
0001.0	0001.0	83.135	75.94	63.113	87.68	1260
0001.0	0001.0	67.143	38.103	75.127	25.84	1380

[1]Time after the start of the test and control chicks injected with famotidine

Table 2 - Average water consumption and feed hungry chicks in groups administered with famotidine

P>t Famotidin		Famotidin		Witness		
Hunger (ML)	Satiety (ML)	Hunger (ML)	Satiety)(ML)	Hunger (ML)	Satiety (ML)	Time (Min)[1]
4754.0	8151.0	83.2	37.2	0	0	15
9316.0	8918.0	83.5	3	37.0	5.2	30
0071.0	3952.0	33.11	25.3	62.0	37.6	45
0071.0	1179.0	33.11	8.3	62.0	62.9	60
0053.0	8383.0	83.12	25.10	75.1	11	90
0043.0	8383.0	18	37.12	62.6	62.11	120
0817.0	2476.0	66.35	37.18	75.28	12.14	180
0006.0	0323.0	83.47	75.24	25.34	87.16	240
0027.0	0528.0	6.58	5.28	25.46	37.21	300
004.0	0035.0	33.64	34	12.53	25.23	360
0001.0	0039.0	16.72	87.37	5.55	25.27	420
0001.0	0044.0	66.77	12.42	87.59	62.31	480
0001.0	0049.0	83.81	50.48	65	12.38	540
0001.0	0008.0	83.84	62.52	50.66	75.41	600
0001.0	0002.0	33.87	50.60	62.69	75.46	660
0001.0	0020.0	5.88	62.62	87.70	25.51	720
0001.0	0001.0	83.135	75.94	63.113	87.68	1260
0001.0	0001.0	67.143	38.103	75.127	25.84	1380

1- Time after the start of the test and control chicks injected with famotidine