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Effects of chlorpheniramine (histamine H1 receptor antagonist) on food and water intake in broiler chickens in 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 chlorpheniramine as histamine H1-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 chlorpheniramine (40 mg per kg of body weight) intraperitoneally, feed intake and water per chick at intervals of 15, 30, 45, 60, 90 min and2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 21, 23 h after injection and the controls weight was recorded. The results showed that chlorpheniramine in satiety after injection caused a significant decrease ($p < 0.0001$) in feed intake compared with the control group. Chlorpheniramine injection in starvation mode after injection induced a significant decrease ($p < 0.0001$) in feed intake compared with the control group. Satiety in a state of chlorpheniramine in180, 240,300, 360, 420, 480, 540, 600, 660, 720 min after injection ($p < 0.0001$) caused a significant reduction in water use. Chlorpheniramine injection, at 180, 240, 300, 360, 420, 480, 540, 600min after injection ($p < 0.05$) caused a significant reduction in water consumption.

Keywords: Broiler, feed intake, hunger and satiety, chlorpheniramine, histamine H_1 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 (Attoub et al., 2001). Histamine is a neurotransmitter their physiological effects on target cells in the brain that stimulates three classes of receptors, including receptors H_1, H_2 and

H_3 located in the cytoplasmic membrane is applied (Babapour et al., 1999 and Black et al., 1972). Inhibition or activation of these receptors in many brain regulatory functions, including sleep and wakefulness, brain stimulation, etc. that affect cardiovascular activity (Brown et al., 2001). The central control various aspects of feeding behavior, food and water intake values (Costentin, 2004 and Tamaddonfard et al., 1999) fusion activity, food intake and eating rate (Fujise et al., 1998) and circadian rhythm of food intake and water (Doi et al., 1994 and Lecklin et al., 1998) Sets Intracranial administration Histamin, feed intake in animals, goats, cattle and broiler chickens reduced (Machidori et al., 1992 and Meade et al., 2001 and Tuomisto et al., 1979). In some experiments, intraperitoneal injection of histamine reduces food intake in rats (Gay et al., 2001 and Attoub et al., 2001) . Histamine is also considered one of the most important factors that influence drinking behavior has been identified in mice (Lecklin et al., 1998). But intracerebral injection of histamine in broiler chickens had no effect on drinking behavior (Meade et al., 2001) .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 in mammals, studies in rat neurons . 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 (Kuenzel et al., 1994).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 (Cabrera et al., 2006). 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 broiler management there (Kawakami et al.,(2000 . One of these solutions is the use of a histamine H_1 receptor antagonist chlorpheniramine as. The aim of this study was to evaluate the nutritional status of satiety and hunger intraperitoneally administration of chlorpheniramine in 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. The control group of chlorpheniramine 40 mg per kg of body weight and the amount of saline 0.5 mL to The chicks were injected intraperitoneally. Feed consumption per chick at intervals of 15, 30, 45, 60, 60 min 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 was 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

The results of the effect of chlorpheniramine in broiler chicks on feed and water intake compared with the control group are shown in Table 1 and 2.The results showed that chlorpheniramine in satiety, 15, 30, 45, 60, 90, 120 minutes after the test has no effect on water consumption compared with the control group. Chlorpheniramine in 30.45, 60, 90, 120, 180, 240, 300, 360, 420, 480, 540, 600, 660, 720, 1260, 1380 min after injection, a significant decrease ($p < 0.0001$) in use compared with the control group was fed. Chlorpheniramine in starvation mode , at 15 , 30, 45, 60, 90, 120, 180, 240, 300, 360, 420, 480, 540, 600, 660, 720, 1260, 1380 min after injection ($p < 0.0001$) causes significant reduction in food intake compared with the control group. satiety in a state of chlorpheniramine , 180, 240,300 , 360, 420, 480, 540, 600, 660, 720 min after injection ($p < 0.0001$) induced a significant decrease in water intake , but in 1260 , 1380 minutes injection ($p < 0.0001$) caused a significant increase in water use . Chlorpheniramine in starvation mode, at 15, 45, 60, 90, 120, 660, 720 min after the injection of water consumption : not Influence 180 240 , 300, 360, 420, 480, 540, 600 min after injection ($p < 0.05$) caused a significant reduction in water consumption . In 1260 and 1380 min after injection ($p < 0.0001$) caused a significant increase in water consumption.

Discussion

We receptor antagonist H1 (chlorpheniramine) contrary to expectations, did not increase feed intake and feed the hungry chickens decreased significantly ($p < 0.0001$) in use Feed established, and for the first time that such a result is obtained in broilers. Chlorpheniramine the chicks had free access to feed had a greater impact on reducing food intake. The results of our experiments showed that the H1 receptor, histamine was not involved in the inhibition of dietary intake, the results of our study with the results of Cabrera (Cabrera et al., 2006) (which we studied in the same conditions) Not coincide, because, according to (Cabrera et al., 2006) Intraperitoneal injection of histamine on broiler, H1 receptor is involved in the inhibition of food intake rather than receptor H2, and H1 receptor antagonist injection caused a significant increase in the amount of the feed was consumed (Cabrera et al., 2006).

Reported from previous studies, including Attoub (Attoub et al., 2001) also shows that the intracerebral injection of histamine in broilers, feeding inhibition by histamine H1 receptor is involved, then it seems Histamine H1 receptor the supplements act (Attoub et al., 2001). But we did a survey of the H1 receptor antagonist caused a drastic decline in food intake in chickens, so cannot be said of histamine H1 receptor acts. Because of its histamine reduces food intake, the reduction in food intake should come from one of the other histamine receptors, the receptor It is involved in the injection of the antagonist increases food intake, but its H1 receptor antagonist of histamine, possibly decreasing the feed intake after The other receptor is reduced feed intake. It seems likely that the H1 receptor and opioid system there is a relationship between pain in the H1 receptor antagonist is dependent on the opioid system (Tamaddonfard et al., 2002), then according to this relationship, and also Given that opioids are reduced feed intake could possibly reduce the consumption of food by the H1-receptor antagonists may be associated with opioid system.

Chlorpheniramine satiety and hunger in the circadian rhythm of food intake impact, so the day was a sharp reduction in food intake compared to the control group, but feed intake during the night. Slope petulancy was increasing.

This research revealed that the chickens were in a state of satiety and reagents as Was injected intraperitoneally, Chlorpheniramine first 120 minutes showed no effect on water consumption but 180 min after injection until the end of the experiment a significant reduction in water

consumption when compared to the control group, Chlorpheniramine in satiety and hunger circadian rhythm of Was impact water, so water consumed during the day than the control group had a sharp decline But during the night the water rose with sharp gradients. But when the chicks were starved for 24 h and reagents were injected intraperitoneally, chlorpheniramine 120 Min after injection to 600 min after injection caused a significant reduction in water consumption, histamine from 120 minutes to 720 minutes after injection after injection caused a significant increase in water consumption. The results show an increase in Bnvshy H1 receptor, which Caused by histamine is involved, these results with results of Rossi et al (Rossi et al., 1998) showed that intraperitoneal injection of the H1-receptor antagonist resulted in a significant reduction in water consumption to be in goats (Rossi et al.,1998) is consistent that histamine and its antagonists underway as pigs injected intraperitoneally showed water consumption, food consumption rises, we also proved that testing, and it seems this phenomenon By different mechanisms, including angiotensin and histamine release is regulated (Rossi et al.,1998). Such a result will become some of us with Kjaer (Kjaer et al.,1994 and Rao et al.,1987 and Ritche et al., 2001) showed that water use consistent with that of a monogastric (birds) are associated with eating.

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

P>t (Chlorpheniramine)		Chlorpheniramine		Witness		
Hunger (gr)	Satiety (gr)	Hunger (gr)	Satiety (gr)	Hunger (gr)	Satiety (gr)	Time (Min)[1]
0001.0	7173.0	0	0	12.13	87.1	15
0001.0	0015.0	625.0	0	62.20	11	30
0001.0	0001.0	25.1	0	87.26	14	45
0001.0	0001.0	25.1	0	25.32	87.17	60
0001.0	0001.0	25.1	0	62.36	62.19	90
0001.0	0001.0	25.1	0	87.39	5.25	120
0001.0	0001.0	25.1	0	5.44	12.28	180
0001.0	0001.0	125.3	0	62.50	35	240
0001.0	0001.0	625.5	75.0	62.54	25.40	300
0001.0	0001.0	875.11	875.0	37.58	50.42	360
0001.0	0001.0	125.16	59.1	75.60	50	420
0001.0	0/0001	125.18	285.2	25.65	62.52	480
0001.0	0001.0	375.20	47.2	75.67	12.57	540
0001.0	0001.0	28	62.2	25.71	87.61	600
0001.0	0001.0	13.29	97.2	25.72	75.67	660
0001.0	0001.0	5.34	65.5	76	25.71	720
0001.0	0001.0	54	07.45	50.93	37.88	1260
0001.0	0001.0	5.60	36.52	75.100	25.101	1380

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

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

P>t)Chlorpheniramine(		Chlorpheniramine		Witness		
Hunger (M1)	Satiety (M1)	Hunger (M1)	Satiety (M1)	Hunger (M1)	Satiety (M1)	Time (min)[1]
9700.0	0829.0	142.0	87.0	0	0	15
9588.0	2858.0	57.0	15.2	37.0	5.2	30
8035.0	8023.0	57.1	17.2	62.0	37.6	45
4168.0	2047.0	71.3	37.2	62.0	62.9	60
5542.0	0830.0	4	62.2	75.1	11	90
5141.0	0530.0	142.4	3	62.6	62.11	120
0001.0	0140.0	28.4	4	75.28	12.14	180
0001.0	0034.0	14.6	08.5	25.34	87.16	240
0001.0	0001.0	71.9	72.6	25.46	37.21	300
0001.0	0001.0	28.15	27.8	12.53	25.23	360
0001.0	0001.0	85.16	31.9	5.55	25.27	420
0001.0	0001.0	42.33	59.11	87.59	62.31	480
0001.0	0001.0	71.46	33.14	65	12.38	540
0014.0	0001.0	28.54	28.16	50.66	75.41	600
2701.0	0001.0	42.65	41.16	62.69	75.46	660
7037.0	0001.0	42.69	46.22	87.70	25.51	720
0001.0	0001.0	134	5.90	63.113	87.68	1260
0123.0	0001.0	29.137	65.99	75.127	25.84	1380

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