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Research Article

Water Consumption and Faecal Production Depending on Live Weight in Geese

Kazlarda Canlı Ağırlığa Bağlı Olarak Su Tüketimi ve Dışkı Üretimi

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Abstract: The aim of this study was to determine the average daily water consumption, daily faeces and faecal dry matter content in relation to body weight in Turkish geese. For this purpose, 24 adult male geese aged 48 weeks were used. The geese were weighed in terms of live weight at the beginning of the experiment and divided into 3 groups as low (3124 - 3864 grams), medium (3865 - 4160 grams) and high (4161 - 4780 grams). Data were taken from the geese for 24 hours one day every week for 4 weeks. Within 24 hours, water consumption and the amount of faeces produced by male geese fed with 200 g feed were determined. Faecal dry matter content was also determined. In the study, the amount of daily faeces did not differ according to the live weight groups and the average faeces amount was determined as 237.83 grams. Again, there was no difference in the amount of water consumed according to body weight, and an average water consumption of 600 ml was determined. The average faecal dry matter content was found to be 78.19%. The results of the study showed that daily water consumption was 3 times the average amount of feed consumed.

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1. Introduction

Water is the most influential, yet most overlooked aspect of poultry production performance. Poultry can live for weeks without feed, but not even a few days without water. Water is vital for the body with its functions such as the passage and transportation of nutrients in the digestive system. It is involved in many enzymatic and chemical reactions in the body, regulation of body temperature,

lubrication of joints and organs and excretion of residues and toxins from the body (Aksoy et al., 2000).

Maintaining body water balance under normal physiological conditions is related to water intake and excretion. The water requirement of the body is met by drinking water (70%), consumed feed (10%) and metabolic water (20%) formed as a result of oxidation of organic nutrients (protein, fat and carbohydrate) taken with feed. Water is excreted from the body through respiration, feces, growth and yield (Leeson et al., 1976; Karaalp and Demir, 1995). Water consumption in poultry may vary depending on genotype (age, sex, productivity level), environment (temperature, humidity and other poultry house conditions), feeding (feed intake, feed composition and form) and rearing management (water temperature, type of drinker and water presentation) (Açıkgöz et al., 2002).

Feces, which is a by-product of poultry, refers to animal excreta consisting of undigested feed and body residues mixed with urine (Türkoğlu et al., 1997). Animals cannot digest all of the nutrients they consume and excrete a significant amount of them as feces (Baydan and Yıldız, 2000). The amounts and chemical compositions of feces obtained from animals vary according to the type of animal, number of animals raised, age, weight, disease status, feeding method, feed consumption, type of poultry house and litter, environmental conditions, obtaining and drying technique, drying temperature, duration and storage conditions (Baydan and Yıldız, 2000).

The aim of this study was to determine the daily (24 hours) water consumption and the amount of feces produced depending on live weight in male geese of local genotypes.

2. Material and Method

2.1. Material of the Study

The material of the study consisted of 24 male geese of local Turkish genotypes at 48 weeks of age. The geese were placed in individual cages in a poultry house in Bozok University Agricultural Research and Practice Center with 80 m^2 floor area, 6 windows and 1 fan at 48 weeks of age.

2.2. Methods Used in Data Gathering and Analysis

The geese were weighed in terms of live weight at the beginning of the experiment and divided into 3 groups as low (3124 - 3864 grams), medium (3865 - 4160 grams) and high (4161 - 4780 grams). Data were taken from the geese for 24 hours once a week for 4 weeks. The cages were made of wire mesh system and their dimensions were 100x100x100 cm. There is one individual feeder and drinker in each cage. Cage bottoms are wire mesh and perforated. Under each cage, there are independent, portable and cleanable wooden underlayers. The substrate was cleaned at the beginning of the time interval (24 hours) determined for fecal measurements. At the end of the specified time, the feces on the substrate were cleaned with a spatula and taken into the measuring cups. The feces in the tared measuring cups were weighed with a scale with a precision of 0.1 gram. Male geese were given 200 grams of limited feed daily, and the remaining feed amount on the analysis days was weighed again with a 0.1 gram scale and daily (24 hours) feed consumption was determined. On the day of analysis, 1000 ml of water was measured and poured into the drinkers. At the end of 24 hours, the remaining water was determined in ml. Dry matter analysis of fecal samples was determined in the laboratory according to AOAC (1990) and expressed as % (Sarıca and Çam, 1998).

2.3. Statistical Analysis

The data obtained in the study were evaluated using One-Way Analysis of Variance (ANOVA) and Tukey test in Windows SPSS 20.0 computer program. A value of $P<0.05$ was considered statistically significant.

3. Result and Discussion

In the study, male geese were fed 200 grams of limited feed daily. However, since not all geese consumed feed at the same rate, the feed consumed in the treatment groups was also calculated. Feed consumption differed according to body weight groups (P<0.05) and the group with the highest body weight had the highest feed consumption (Table 1).

Table 1. Feed intake (g) based on body weight

Body weight	Feed intake	min	max
Low	197.1[ab]	173.6	200.0
Medium	192.9[b]	124.0	200.0
High	198.1[a]	184.0	200.0
Total	196.1	124.00	200.0
SEM	*0.961*		
P	*		

SEM; Standard Error of Means, P; treatment effect, a, b; Means within columns with no common superscript letter differ significantly (P<0.05); *; P<0.05.

Daily water consumption did not differ depending on body weight (P>0.05; Table 2). Considering each treatment group in water consumption, the maximum water consumption was 750 ml and the minimum water consumption was 100 ml in male geese.

There was no difference between the treatment groups in feces production based on body weight (P>0.05; Table 2). The minimum amount of feces produced from geese was 74.3 grams and the maximum amount of feces production was 437.9 grams.

Table 2. Water Consumption (ml) based on body weight

Body weight	Water Consumption	min	max
Low	585.9	315.0	750.0
Medium	592.8	100.0	750.0
High	621.4	340.0	750.0
Total	600.1	100.0	750.0
SEM	*13.450*		
P	*NS*		

SEM; Standard Error of Means, P; treatment effect, NS: P>0.05.

Table 3. Feces production (g) based on body weight

Body weight	Feces production	min	max
Low	226,0	130.2	399.1
Medium	244.7	74.3	335.9
High	242.8	107.1	437.9
Total	237.8	74.3	437.9
SEM	*6.632*		
P	NS		

SEM; Standard Error of Means, P; treatment effect, NS: P>0.05.

There was a difference between the dry matter (DM) content of the feces obtained among the treatment groups (P<0.05). While the DM ratio was lower in the group with medium body weight, it showed the highest value in the group with low body weight. The maximum DM rate was 70.7% and the minimum DM rate was 87.6%.

Table 4. Faecal dry matter (DM) content (%) in relation to live weight

Body weight	faecal DM	min	max
Low	79.1[a]	72.3	85.0
Medium	77.2[b]	70.7	86.3
High	78.4[ab]	71.8	87.6
Total	78.2	70.7	87.6
SEM	0.359		
P	*		

SEM; Standard Error of Means, P; treatment effect, a, b; Means within columns with no common superscript letter differ significantly (P<0.05); *; P<0.05.

It is reported that there is a relationship between feed consumption and water consumption in poultry (Belyavin, 1991). In a study conducted with unlimited feeding in laying hens, the correlation between feed and water consumption was found to be 0.73 (Savory, 1978). Akbay (1985) reported the ratio of feed and water consumption in laying hens as 1/1.5-2. In our study, this ratio was 1/2.9-3.1.

Water and feed consumption may vary depending on genotype and environmental conditions. Although there was no statistical difference depending on body weight in the study, water consumption showed a trend parallel to body weight. However, feed consumption did not show the same trend. Similarly, fecal production did not show the same trend. This may be a species-specific situation. Because the factors affecting feed and water consumption and feces production were similar for all geese in this study. The intake and drying of the feces, drying temperature and duration may also have been effective here.

In previous studies, it was reported that the water content of feces of cattle, sheep, horse and chicken was 21%, 36%, 41% and 24%, respectively (Küçükersan, 1993). In geese, this rate was determined between 20.9% and 22.8%.

4. Conclusion

In the study, it was observed that domestic genotype Turkish male geese with low, medium and high body weights had similar water consumption and fecal production. It was determined that the amount of feed consumption and fecal dry matter ratio changed depending on live weight. Although water consumption and feces production were similar, it was also determined that fecal dry matter ratio could be different: When the results of the study were evaluated in general, it was determined that the daily water consumption in male geese was on average three times the amount of feed consumed.

Acknowledments

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