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Impact of using licorice root aqueous extract, on Peking duck carcass

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Abstract

The study conducted in one of the private fields for raising Peking ducks in Al-Muthanna Governorate, starting from 14/2/2025 to10/4/2025. 60 one-day-old Peking ducklings were raised from unsexed Peking ducks with an average weight of 42g. The ducklings were prepared from the local markets in Diwaniyah Governorate, to demonstrate the effect of studying different levels of aqueous extract of licorice on carcass of Peking ducks.

The chicks were randomly assigned to four treatments, each with three replicates (5 chicks per replica). They were placed in twelve pens. The trial consisted of the following treatments:

T1: Control treatment (no addition).

T2: 5 ml of licorice aqueous/ L

T3: 10 ml of licorice aqueous/ L

T4: 15 ml of licorice aqueous/ L

The results indicated the following:

The addition of licorice aqueous extract to the drinking water of Peking ducks resulted in remarkable improvement. In the researched production traits, body weight, weight gain, and feed conversion ratio improvement were examined. The fourth treatment, which used 15 ml of licorice aqueous extract per liter of drinking water, produced the best results.

The results showed a significant increase in the dressing percentage with and without edible viscera, the relative weight of edible viscera (giblet), and the relative weight of the main cuts, with a significant decrease in the secondary cuts of Peking duck carcasses treated with various levels of licorice aqueous extract, particularly at a concentration of 15 ml/liter of drinking water.

Keywords: ducks, carcass, licorice aqueous extract.

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I. Introduction:

Domesticated birds are among the first animals domesticated by humans and raised for egg and meat production. The term poultry covers a wide range of domestic and commercial bird breeds, including chickens, ducks, turkeys, geese, quails, pigeons, and ostriches. Poultry is raised all over the world, with chicken being the leading species everywhere, while ducks are found in large numbers in Asia compared to other regions, while turkeys are the most prevalent in North America, followed by Europe and Asia (FAO, 2020). Ducks are a source of livestock and are waterfowl raised under human supervision. Duck farming is common in most countries of the world. Ducks are raised in areas close to ponds, swamps and marshes. Ducks have many characteristics that distinguish them from other types of domestic birds. These characteristics include rapid growth rates and a good feed conversion rate (Jassim et al., 2011).

In addition to their high animal protein production, with their meat containing no less than 20% animal protein, duck production has increased significantly in recent years (Madaline, 2006). This is due to red duck meat having higher levels of fat (high unsaturated fatty acids) and energy than chicken and turkey (Baeza, 2006). Ducks are raised for two purposes: the first is for meat production. Ducks that are selectively raised for their meat are known as Peking ducks, as they grow faster than other types of ducks. The second purpose is egg production, as female ducks lay 200-300 eggs per year (Kim, 2022).

Ducks eat a range of items, including earthworms, snails, slugs, tiny fish, grass, and aquatic plants (greens and roots). This diversified diet ensures that ducks receive the nourishment they require for optimal growth and development, as well as survival throughout long migrations (Mossy, 2018).

To stimulate growth and improve health, poultry farmers, including ducks, use antibiotics as a feed additive that increases their growth rates and reduces the microbiome, due to the negative effects of antibiotics on consumers' health, they have been banned in the European Union (Shabaan, 2012). There has been a significant shift towards using medicinal herbs, plants, and extracts instead of antibiotics (Lewis, 2003; Demir, 2008). Many studies shown the impact of plants on the digestive system (Ramakrishna, 2003) due to their antimicrobial and antioxidant properties (Sivropoulou, 1996; Botsoglou, 1997).

As a result, medicinal herbs aid in enhancing digestive activity, activating intestinal mucous membranes, preventing infections, and strengthening the microbial balance in the intestines. (Al-salhie, 2017). As a result, medicinal plants contain one or more chemical substances in one or more of their organs at varying concentrations, and these active substances have the physiological ability to treat a specific disease or alleviate the symptoms of infection with that disease. As a result, these plants were employed naturally by incorporating the active components collected from them.

Among the most important medicinal plants used to treat many diseases are cumin (Divakara, 2013), black seed (Hamza, 1999), and licorice (Al-Daraji et al., 2003).

Licorice is an ancient medicinal plant that belongs to the bean family (Fabaceae). It contributes significantly to the physiological effectiveness of the body since it contains active components that activate the immune system of birds. When we use aqueous licorice extract in the birds' drinking water, we see beneficial outcomes in terms of growth rates and immunity to numerous diseases (Soufy et al., 2012).

Due to the lack of studies on duck farming in Iraq and the study of their nutritional requirements and the necessary nutritional supplements to enhance duck growth and improve their health, and in view of the modern trend towards the use of nutritional supplements and natural alternatives such as medicinal plants, including licorice roots with health and medical specifications, this study was conducted to determine impact of adding an aqueous of licorice at different concentrations and its effect on the immune characteristics and oxidation state of Peking ducks.

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II. Materials

After weighing the carcasses to calculate the net weight percentage, the carcass was (Chest, thigh, and femoral hump) and secondary cuts (back, wings, and neck) as reported by Al-Fayyadh et al. (2012). Each cut was weighed separately and the percentage of the cut weights to the carcass weight was calculated.

III. Results and discussion

Table (1) indicates the effect of utilizing an aqueous extract of licorice root on the cold carcass weight and the relative weight of the major and secondary cuts of Peking duck carcasses, with T4 being significantly superior. There was a significant increase (P≥0.05) in cold carcass weight and principal cuts (chest, thigh, and femoral-ankle junction) compared to T3. T2 outperformed T1 by a significant margin (P≥0.05).

Table 1 shows the impact of utilizing an aqueous extract of licorice root on the cold carcass weight and relative weight of the main cuts (%) of Peking duck carcasses ± standard error.

Treatments	Carcass Weight	Relative weight of major segments		
		Chest	thigh	for the ankle-femoral junction
T1	5.85± 807.69 D	0 .03 ±25.02 D	0 .02±14.25 D	0 .04 ±11.81 D
T2	4.91± 932.95 C	0 .05 ± .26.57 C	02 ±14.52.0 C	0 .02 ±12.12 C
T3	6.74± 974.21 B	0 .01 ±25.80 B	0. 01 ± 14.74 B	0 .02 ±12.34 B
T4	6.73±1017.49 A	0 .02. ±25.98 A	0 .02 ±14.96 A	0 .02 ±12.56 A
Sig.	*	*	*	*

* significant at 0.05.

Table (2) indicates how the aqueous extract of licorice root affects the relative weight of the secondary cuts of Peking duck carcasses (wings, back, and neck). The control therapy outperformed T2, T3, and T4 significantly (P≥0.05).

Table (2) shows the impact of utilizing an aqueous extract of licorice root on the relative weight of secondary cuts (%) in Peking duck carcasses

Relative weight of secondary segments		
Neck	Wings	Back
0 .023 ±6.22 A	0 .10±29.85 A	0 .027 ±12.81 a
0 .026 ±5.88 B	0 .070 ±29.44 B	0 .026 ± 12.44 b

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0 .012.±5.67 C	0 .027 ±29.12 C	0 .017 ±12.29 c
0 .032 ±5.47 D	0 .092± 28.88 D	0 .032 ±5.47 d
*	*	*

* significant at 0.05.

Because the net percentage of edible and inedible viscera increased in all treatments when compared to the control treatment, the experiment's results demonstrate a significant improvement in the carcass characteristics of the licorice root aqueous extract treatments when compared to the control treatment. Both the percentage rate with internal organs and the percentage rate without internal organs significantly increased after consuming water treated with licorice root extract at varying doses. Positive alterations in the blood's metabolic components and active cellular elements in birds treated with licorice root extract may be the cause of this shift (Al-Daraji et al., 2004). When licorice root extract was added to drinking water, the birds' weight gain and feed conversion ratio improved, which resulted in a significant decrease in the relative weight of the secondary cuts (neck, wings, and back) and a significant increase in the relative weight of the main cuts (thigh, chest, and femoral junction) of Peking duckling carcasses (Al-Daraji et al., 2003).

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