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Effects of using different herbs mixture on fat percentage and other carcass traits of broilers of Chaharmahal and Bakhtiyari province

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Abstract

A four-stage test was conducted to evaluate effects of using different several herbs on carcass traits of in chaharmahal and Bakhtiyari province. In each test 240 broiler chicks strain (head - 308) in a randomly design were based on NRC (1994) tested with 4 treatment and 3 replication (with 20 broiler chicks in each replication) from 1 to 42 days old in two first breeding period (1- 21 days) and growth (22-42 days). Used rations in test groups in the first group include: -1 marker (without using herbs). -2 containing 1 percent K.Kuti +0.5% penny royal +0.5% smmer savory and -4 containing 0.5% K.kuti +0.5% nettle +1% summer savory. The medicinal plants used in second test are nettle, penny royal and K.Kuti, in the third test such plants used as mallow, camel thorn and mint and in the fourth test thyme, nettle and alfalfa which were respectively used as in the first test. The results showed that using a mixture of herbs has significant effects on carcass compound of broilers. In the first experiment the highest percentage of carcasses (70.76) and (6.34) the lowest percentages of abdominal fat and GI (2.34) and (3.34) in the third experimental group, in the second experiment the highest percentage of carcass, chest and the lowest abdominal fat (72.72), (33.67) and (3.4) in the third experimental group by using 0.5% nettle +1% penny royal +0.5 K.Kuti and in the third experiment the highest carcass percentage (70.19) in the third experiment group containing 0.5% .+1% camel thorn +0.5% mint were gotten. It is concluded that using several herb mixture has positive effects on carcass traits of broilers.

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Introduction

Today, low-fat diet as recommended by nutritionists is for society especially those who are involved with obesity and overweight. One way to reduce calories is reducing the amount of them is their current products (Becker *et al.*, 1981 and Karimi and Fathy, 2010). In recent years, in Iran consuming white meat such as chicken has been increased. Considering the consuming amount, reducing fat percentage amount in broilers herbs can be useful in reducing fat intake by consumers (Lenstra, 1981 and Twinning *et al.*, 1978). A lot of fat in carcass had adverse effects on processing properties, storage and color and flavor of carcass, and reduces its marketability (Orr *et al.*, 1984). Since more energy is required to produce fat than protein, higher amount over it is not economical from the standpoint of culture and followed by reducing the percentage of carcasses and associated with abnormalities and complications (Mayes, 1980; Deaton, 1983 and Sizemore and Barbato, 2002). Reducing the carcass fat especially abdominal fat (which is in direct relation with fat percentage of carcass) is one of the issues that a variety of searches by using nutritional policies and chemicals have been conducted on them. In recent years using herbs was taken into consideration in birds breeding considering hygienic and nutritional viewpoints (Alcicek *et al.*, 2003). Some advantages mentioned for hers include easily application and lacking adverse effects on consumers (Rojhan, 2001 and Zargari, 2003).

As reported in Turkey, using oily compounds of a few wild plants had positive effects on broilers performance (Alcicek *et al.*, 2003).

It has been showed that using extracts of Artemisia, thyme and Rosemary made a rapid growth intestinal digestion improvement, starch digestibility, usability of dry matters and rations and improving carcass traits of broilers (Herandez *et al.*, 2004). The caracole in some of the herbs has germicidal effects and by reducing microbial population of the gastrointestinal, broilers prevents the decomposition amino acids and

underlies its more intake and carcass trait improvement (Lee *et al.*, 2003). Aqueous extract of nettle is antioxidant and applying it on fame animals protects carcass quality well and improvises the proportion of unsaturated fatty acids with poly-links to fatty saturated acids in their carcass (Herandez *et al.*, 2004). Adding the mixture of several herbs to the caryopsis grass silage and feeding it on farm animals improves the taste, flavor and long-term storage water and slows down the discoloration of carcass (Wiytkiewicz and Hanczakowska, 2008).

The purpose this study

According to global approach to the use of herb and Iranian offshore richness of various plant species, the present experiment was conducted to evaluate effects of several mixtures of different herbs in the current human use and evaluate their effects on carcass quality and especially reduction of abdominal fat percentage and increasing the percentage of important and valuable parts of carcass especially chest percentage.

Materials and methods

Space experiment

Four experiments were conducted to evaluate the effects of using different mixture of several herbs on carcass character in broilers. In each of experiments, 240 broiler chicks strain (308- head) in a randomly design were tasted with 4 treatment and 3 replication (20 broiler chick per each replication) from 1 to 42 day old in the early breeding (1-21 days old) and growth (22-42 days old) (table 1).

Experimental diets based on foods such as corn-soybean meals and due to nutrient requirements recommended in NRC (1994) were set for broilers with the same energy and crude protein and by using UFFDA (table 2 and 3).

Combined mineral supplement use per kg includes

Manganese sulfate 248 mg; ferrous sulfate (125) mg; Zn 221 mg, copper sulfate 25 mg, calcium iodate 25

(mg), selenium 0.5 mg, 625 mg, antioxidants 2.5 mg.

Combined Vitamin supplement use per kg includes

Vitamin A (IV) 22500, Vitamin D3 (IV) 5000, Vitamin E (IV) 45, Vitamin K 5 (mg), Vitamin B1 3/4 mg, Vitamin B2 16.5 (mg), Vitamin B12 0.04 (mg), Pantothenic acid 24.5 g, Folic acid 2.5 mg, Niacin 74 mg, pyridoxine 7.3 (mg), Biotin 0.04 mg.

Combined mineral supplement used per kg includes

Manages sulfate 248 mg, ferrous sulfate 125 mg, Zn 211mg, copper sulfate 25 mg, calcium iodate 25 mg, selenium 0.5 mg, 625 mg Antioxidants 2.5 mg.

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Required amounts of dried herbs used in the experiments were purchased from grocery and after they were thoroughly grounded, the required amount was determined and first it was mixed with low intake of dietary components and after sufficient stirring and increasing its size, the diet was added to the rest of the food items and were thoroughly mixed into a

mixer and were used during experiment running. During the test, the environmental conditions was the same for all experimental groups. Light planning consists of 24 h illumination during 3 first days for broilers could get used to the environment and the people around and since 3 days old then after they were placed in dark environment for 1 h within a car taint time of the day. The feed intake and weight gain in chickens were means ured weekly. At the end of the test 2 chicken species (a male and a female) whose weight of the experimental units was close to the average weight were sampled from each experimental unit, and by recording the details, they left hungry for 9-12 h to empty the digestive tract from food, and after weighing and determining their alive weight they were slaughtered and their carcass weight was determined and percent of carcass and other parts of carcass were determined through live weight. Finally, the resulted data were analyzed by statistical software SAS (SAS, 2005) and the means were compared by using Duncan's multiple range tests 3.

Result

The results from effects of different mixtures of herbs on carcass traits are given in Tables 4-7. The results from effects of different combinations of herbs; Penny royalm, summer savory and K.Kuti on carcass quality are given in table 4.

Table 1. Combination of herbs mixed experimental groups during different experiments.

experiments					Experimental groups
4	3	2	1		
control	control	control	control		1
1% thyme nettle+0.5% alfalfa	+0.5% 1% mallow thorn +0.5% mallow camel thorn	+0.5% camel +1% royal tenuoil	1% nettle +0.5% penny zizophora royal +0.5% zizophora royal +0.5% savory		2
%1% thyme nettle royal+0.5% alfalfa	+0.5% %0.5% mallow camel thorn +0.5 mint	+1% %0.5% nettle Penny zizophora tenuoil	+1% %0.5%zizophora royal+0.5 Penny smmer savory		3
%0.5% thyme nettle +1% alfalfa	+0.5% %0.5% mallow camel thorn +1%percent camel thorn	+0.5% %0.5% nettle Penny zizophora tenuoil	+0.5% %0.5% zizophora royal+1% +0.5% Penny royal+0.5 savory		4

Ca. Each row of numbers cottage different letters statistically has significant difference. Using different

compositions of several herbs such as K.Kuti, Penny royal and summer savory have significant effects on

the combination of broilers carcass ($P < 0.05$). The highest percent of carcass (70.76) and the lowest percents related to abdominal fat and gastrointestinal fat (2.34) and (6.34) were observed in experimental groups. Although no significant difference was observed in the other carcass traits within

experimental groups, numerically the highest chest percent and the lowest gizzard percent were observed in this experimental group. The result from effects of different combinations of herbs such as nettle, Penny royal and ziziphora tenuior on carcass quality are given in table 5.

Table 2. Food items and composition of used diets in the early breeding stage experiments (1-21 days old).

Herbs mixture percent	Food items (percent on diet) composition of diets.
0	
58.51	corn
32.72	Soybean meal
3	Fish meal
2.53	Vegetable oil
0	Herbs mixture
1.3	Oyster shell
1.06	Dicalcium phosphate
0.23	salt
0.25	*mineral supplement
0.25	**vitamin supplement
0.15	DL-methionine
	Calculated analyze of diets
3000	Energy (kcal over kg)
21.56	Protein (percent)
0.94	Calcium (percent)
0.42	Avail phosephore (percent)
0.14	Sodium (percent)
1.42	CLA (percent)
3.71	Crude fibers (percent)
1.25	Lysine (percent)
0.87	Methionine+ systsn (percent)
0.9	Treonine (percent)
0.28	Tryptophan (percent)

Using different combinations of herbs such as nettle, Penny royal and ziziphora terrier there is a significant effect on carcass traits of broilers. ($P < 0.05$), So that the highest carcass percent (72.72), the highest chest percent (33.67) and the lowest abdominal fat percent (3.4) were observed in the third experimental group. Although there was no significant difference in the other carcass traits, numerically, the lowest gizzard and livers weight were observed in this experimental group. The results from effects of different mixtures

of herbs such as mallow, camel thorn and mint on carcass traits of broilers are given in table 6.

Using different levels of herbs such as mallow, camel thorn and mint there is a significant effect on carcass traits of broilers ($P < 0.05$) the highest carcass percent (70.19) was in the third experimental group... Also, numerically the lowest percents were related to GI, gizzard and liver were also observed in this experimental group, whereas the highest chest

percent and the lowest abdominal fat percent were observed in the fourth experimental group and the highest femur percentage was observed in the control

group. Effects of applying different levels of herbs such as thyme, nettle and alfalfa on carcass traits of broilers are given in table7.

Table 3. Food items and composition of used diets in growth phase experiments (22-42 days old).

	Herbs mixture percent	Food items (percent on diet) composition of deits.
2	0	
64.80	67.91	corn
26.38	26.06	Soybean meal
2	2	Fish meal
1.8	1.01	Vegetable oil
2	0	Herbs mixure
1.2	1.20	Oyster shell
1.03	1.03	Dicalcium phosphate
0.25	0.25	salt
0.25	0.25	*mineral supplement
0.25	0.25	**vitamin supplement
0.04	0.04	DL-methionine
		Calculated analyze of diets
3000	3000	Energy (kcal over kg)
18.75	18.75	Protein (percent)
0.84	0.84	Calcium (percent)
0.38	0.38	Avail phosephore (percent)
0.14	0.14	Sodium (percent)
1.59	1.64	CLA (percent)
3.76	30.20	Crude fibers (percent)
1.02	1.02	Lysine (percent)
0.68	0.68	Methionine+ systsn (percent)
0.79	0.79	Treonine (percent)
0.24	0.24	Tryptophan (percent)

Table 4 . The comparison of carcass traits average between treatments related to the use of combination of different herbs (K.Kuti. Penny royal and summer savor).

Studied traits (percent)	treatments				
	4	3	2	1	
SEM					
0.55	68.02b	70.76a	69.34ab	ab 69.14	carcass
0.22	3.12a	2.34b	2.91ab	3.52 a	Abdominal fat
0.43	7.92ab	6.34c	8.80a	6.75bc	GI
0.15	2.98	2.53	2.92	2.9	gizzard
0.68	31.59	33.48	31.43	32.12	chest
0.76	27.62	26.7	27.67	28.78	femur
0.22	3.19	2.95	3.24	2.88	liver

b-a. In each row of numbers containing different letters statistically thee is a significant difference (P< 0. 05).

Using different combinations of herbs such as thyme, nettle and penny royal there is no significant effect on carcass combination of broilers ($P < 0.05$). However, numerically the highest carcass percent and the lowest gizzard percent were observed in the third

experimental group, and the lowest abdominal fat percent was observed the second experimental group and the highest chest and femur percent and the lowest GI percent were observed in the fourth experimental group.

Table 5. The comparison of carca trait mean between treatments related to the use of different combinations of herbs (nettle, Penny royal and zizphora tenuior).

treatments					
Studied traits (percent)					
SEM	4	3	2	1	
0.51	71.59ab	72.72a	70.69b	71.89ab	carcass
0.24	3.58b	3.4b	4.67a	3.5b	Abdominal fat
0.45	7.84	7.39	8.11	7.98	GI
0.16	2.55	2.34	2.5	2.38	gizzard
0.71	32.69ab	33.67a	30.94b	32.74ab	chest
0.34	27.29	26.66	27.19	27.11	femur
0.26	2.83	2.65	2.96	3.06	liver

b-a. In each row of numbers containing different letters statistically thee is a significant difference ($P < 0.05$).

Table 6. The comparison of carcass trait average between treatments related to use of different combinations of herbs (mallow, camel thorn, and mint).

treatments					
Studied traits (percent)					
SEM	4	3	2	1	
0.85	69.32a	70.19a	68.26ab	66.77b	carcass
0.66	2.75	3.12	2.80	3.03	Abdominal fat
0.25	7.30	6.24	7.76	7.86	GI
0.17	2.86	2.84	2.97	3.12	gizzard
1.12	34.69	33.28	32.12	32.36	chest
0.38	26.64	26.61	27.2	27.27	femur
0.25	3.37	2.92	2.99	3.67	liver

b-a. In each row of numbers containing different letters statistically thee is a significant difference ($P < 0.05$).

Discussion

Among the efficient and using ingredients found in some of the herbs such as nettle are skirting, carvacol and Menthol, each of which contains unique traits (Zargari, 2003). The skrtin has a stimulatory effect on glands such as pancreas which by the release of hydro lytic protrin, fat and starch enzymes, the rate of digestion and absorption of nutrients in the digestive system increases and efficiency of utilization of amino acids in the carcass rises and they are prevented to

change into secondary materials such as fat, and results in an increase in the percentage of carcass and adversely decreases its fat percentage. The results from this experiment confirm this. Moreover, Some effective materials such as carvacrol are antimicrobial and due these effects, the harmful microbes are considerably decreased in GI (Alcicek *et al.*, 2003). There are a lot of microbial mass in GI such as Unease anzyme secretion which analyzes protein and amino acids by de- amino method and so the significant

amount of protein and amino acids were analyzed and weren't absorbed any more (Lee *et al.*, 2003). Definitely this will result in adverse effects on the carcass combinations such as chest and beneficial microbes can grow and explicate result in optimization of digestion and absorption and improves carcass traits. Gizzard and liver size reduction can be explained in the same way. That

germicidal effect of herbs in reducing the number of harmful microbes in the upper parts of GI or the rate of digestion and absorption and passing through those parts such as gizzard increasingly improves. High crude fiber diets (Penny royal and camel thorn contains more crude fibers than other herbs) increase the rate of digestive flow of GI foods.

Table 7. The effect of comparing the mean carcass traits between treatments due to the use of different combinations of herbs. (Thyme, nettle and penny royal).

treatments					
Studied traits (percent)					
SEM	4	3	2	1	
1.01	67.28	68.65	67.41	67.04	carcass
0.30	3.55	3.47	2.64	3.17	Abdominal fat
0.52	7.43	8.27	8.29	8.06	GI
0.18	2.86	2.49	2.75	2.73	gizzard
0.95	33.25	30.54	30.32	30.64	chest
1.06	28.64	27.97	25.89	28.21	femur
0.23	3.44	3.74	3.51	3.79	liver

And by reducing its shelf-life, gizzard does less heavy works its size doesn't grow much. One of the main functions of the liver in the body is detoxification. When the microbes act they produce toxins and liver acts to neutralize these poisons, as using herbs reduces the number of microbes, fewer toxins are produced and liver bears less working pressure for detoxification, thus its size grows a little.

It is concluded that using different mixtures of herbs has positive effects on carcass combinations such as abdominal fat reduction which is in direct relation with carcass fat percentage and increasing the percentage of breast meat, as the most important viewpoint. The gizzard and liver weight reduction which cost less than breast and femoral meat in the market are economically important.

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