



Current situation of the Zagorje turkey in Croatia

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ABSTRACT

The Zagorje turkey has been reared for more than four centuries in Croatia, in the region of Hrvatsko Zagorje, the major part of which today belongs to the present Krapina-Zagorje and Varaždin counties. The current population of the breeding flock is estimated at 1506 birds. The research was carried on 147 family farms in the region of Hrvatsko Zagorje which rear turkeys of the Zagorje turkey type. A total of 753 birds were weighed and the average weight of cocks and hens was 6.8 kg and 3.9 kg respectively. According to the farmers' reports, the average annual laying rate was 20.6 eggs of which 16.7 adult birds are reared. As regards feather colour, the Zagorje turkey may be subdivided into five varieties of which the bronze variety is the most numerous (50%). The body measurements of the present Zagorje turkeys, such as the body length, body width and the breast bone length and breast depth are not significantly different from those established in 1937.

(Keywords: turkey, body measurements, Croatia)

ZUSAMMENFASSUNG

Gegenwärtige Situation der Zagorianer Truthühner in Kroatien

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Die Zagorianer Truthühner werden bereits seit mehr als 4 Jahrhunderten im kroatischen Zagorje gezüchtet, was heute zum größten Teil in den Komitaten Krapina-Zagorje und Varaždin liegt. Die Zahl der Zuchttierpopulation beträgt gegenwärtig 1506 Tiere. Die Untersuchungen erstreckten sich auf 147 Familienfarmen in Zagorje, die diesen Truthühnertyp aufziehen. Insgesamt wurden 753 Tiere gewogen und festgestellt, dass das Durchschnittsgewicht der männlichen Tiere 6,8 kg, das der Truthennen 3,9 kg beträgt. Die durchschnittliche Legeleistung der Truthennen liegt bei jährlich 20,6 Stück, wovon 16,7 Tiere aufgezogen werden. Aufgrund der Farbe des Gefieders werden 5 Varianten unterschieden, aber zu 50% dominiert das bronzefarbige Gefieder. Die Körpermaße der Zagorianer Truthühner - d.h. Rumpflänge und -breite, die Brustbeinlänge sowie die Brusttiefe - weichen nur unbedeutend von den Werten ab, die 1937 festgestellt wurden.

(Schlüsselwörter: Truthühner, Körpermaße, Kroatien)

INTRODUCTION

Turkeys arrived in Europe soon after the discovery of America and spread very fast throughout Europe, at an annual rate of 40-50 km (*Crawford*, 1992).

In Croatia, to be precise in Hrvatsko Zagorje, the first records on turkeys date back as far as 1561 (quotation from: *Kodinetz*, 1940) and ever since turkeys have been reared in this geographically small but culturally and historically precisely defined region. During the said four-century period, the influence of turkeys from other regions was very small. This conclusion is based on the oral tradition and non-existence of written documents on turkey trading in the otherwise well documented, ecclesiastical and secular history of Hrvatsko Zagorje. The only known influence of other breeds (turkey populations) on the breeding of the Zagorje turkey might be through sixty birds imported from France in the second half of the 19th century (*Kodinetz*, 1940). All this is an indication of a long and isolated turkey rearing tradition in the region of Hrvatsko Zagorje, which has resulted in specific features by which this kind of poultry may be characterised as a breed called the Zagorje turkey.

In Europe the Zagorje turkey became known in the thirties of the 20th century when it was exported to many European countries and the annual exports amounted to 40,000-50,000 birds. This activity ceased at the beginning of the World War Two, when the Zagorje turkey fell into oblivion, in the economic, rearing and scientific sense.

The first and the only research results on the Zagorje turkey were collected and published by *Kodinetz* in 1940. Within the period between 1936 and 1937 *Kodinetz* investigated the situation of the Zagorje turkey population in the region which is today included, by its major part, in the Krapina-Zagorje and Varaždin Counties. The author estimated that the population of the breeding flock in that region was about 28,000 birds at that time.

Among other examinations, *Kodinetz* (1940) took the weights and measures of a sample of some hundred birds during their growth within the age between 0 and 28 weeks. The main conclusion drawn from this research was that in the Zagorje turkey skeleton growth is completed, i.e. maturity is reached at the age of 26-28 weeks when the body measurements are taken for the purpose of the exact external assessment, and the body weight in week 28 was 6.01 kg for cocks and 3.95 kg for hens. *Jaap et al.* (1939) (quotation from *Nixey and Grey*, 1989) came to a similar conclusion and reported that skeleton growth in the turkey ended after 22 weeks in hens and 24-26 weeks in cocks. *Kodinetz* also mentions 8 turkey varieties as regards feather colour, with bronze and grey colours prevailing.

In the course of 1996 a project for the preservation, protection and expansion of the Zagorje turkey was initiated in Croatia, which included research of the current situation of the Zagorje turkey population in its century-old habitat. The aim of our work is to establish the present number and body measurements of the Zagorje turkey breed in Croatia.

MATERIALS AND METHODS

In early spring 1999 a survey of the Zagorje turkey of Krapina-Zagorje and Varaždin counties was performed, which included visits to turkey rearing family farms, the measurements involving only birds which, by their phenotypic appearance,

corresponded to the description provided by Kodinetz in 1940 and which were selected for reproduction in the following year. The following indicators were taken into account:

- number of birds selected for reproduction per farm
- body weight
- body length
- body width
- breast bone length
- breast depth
- feather colour subdivided in five basic varieties
- number of reared young turkeys per hen, as reported by farmers
- estimate of the total number of Zagorje turkeys based on the data collected at the farms surveyed.

Body weights and measurements were taken in accordance with the procedure described by Kodinetz in 1940. The age of the birds examined ranged between 9 and 11 months, which, according to the data from the literature (*Kodinetz, 1940*) coincides with the time when skeleton growth has been completed.

RESULTS AND DISCUSSION

During the Hrvatsko Zagorje survey a total of 147 turkey rearing family farms were visited. This is about one half of the turkey rearing farms in the region, but we estimate with high probability that the number and ratio of the types of birds on these farms are equal to the farms covered by this research.

The *Table 1* shows that the population of the breeding turkeys in Hrvatsko Zagorje is very limited and amounts to as few as 1500 birds. The sex ratio of the birds examined was 1 : 3.73 and an average of 4.79 birds per farm were selected for reproduction. As regards feather colour, i.e. varieties of the Zagorje turkey, the prevailing colours are bronze (50%), grey (18%) and bright (22%).

The comparison between the current number of the Zagorje turkey population and that established in 1937 (*Kodinetz, 1940*) revealed a drastic reduction, by almost 18 times, and this was the main reason for the initiation of the action aimed at saving this interesting and valuable poultry species.

As regards the body weight of the Zagorje turkeys surveyed we have to express certain reserve in respect of the results shown in *Table 2*. That is to say, the current population of the Zagorje turkey is being reared in small flocks and under so-termed 'free conditions', i.e. the birds spend some time on meadows, pasture grounds, in orchards and in tufts, with quite varied nutritional regimes, and all these elements affected the body weight and resulted in relatively high variation coefficients. Yet, if we compare the current body weight of Zagorje turkeys with that reported by *Kodinetz* in 1940, we can see that the figures are very much alike, but we must point out that *Kodinetz's* results refer to younger and, therefore, lighter, birds.

The annual laying rate of the turkey hens examined was 20.6 eggs, which is a relatively high rate in view of the total population, but considering the high variability of the results (var. coeff. = 46.72%) and the fact that they were based only upon the breeders' reports, it is not possible to draw a more specific conclusion. The same is true as regards the number of turkey chickens reared per hen, but still, we can see that the hatching and rearing loss is small and amounts to approx. 20%.

Table 1

Number of Zagorje turkeys in the counties of Krapina-Zagorje and Varaždin

Sex (1)	County(2)						Total (11)		
	Krapina-Zagorje			Varaždin					
	Variety (3)	Examined* (4)	Estimated# (5)	Variety	Examined*	Estimated#	Variety	Examined *	Estimated #
♂	black(6)	8	16	black	5	10	black	13	26
	bronze(7)	51	102	bronze	30	60	bronze	81	162
	grey(8)	18	36	grey	10	20	grey	28	56
	bright(9)	25	50	bright	9	18	bright	34	68
	yellow(10)	2	4	yellow	1	2	yellow	3	6
	Total	104	208	Total	55	110	Total	159	318
♀	black	31	62	black	16	32	black	47	94
	bronze	186	372	bronze	116	232	bronze	302	604
	grey	66	132	grey	41	82	grey	107	214
	bright	92	184	bright	39	78	bright	131	262
	yellow	4	8	yellow	3	6	yellow	7	14
	Total	379	758	Total	215	430	Total	594	1188
							Grand total* ♂+♀ (12) 753		
							Grand total# ♂+♀ 1506		

* Number of birds covered by the research (*Versuchstierbestand*)

Estimated number of birds at approx. 50% family farms not covered by this research (*Von der geschätzte Gesamtzahl der Truthühner wurden nur 50% in den Versuch einbezogen*)

1. Tabelle: Bestand an Zagorianer Truthühnern in den Komitaten Krapina-Zagorje und Varaždin

Geschlecht(1), Komitat(2), Farbe(3), Anzahl der Versuchstiere(4), Geschätzte Bestandszahl(5), Schwarz(6), Bronzefarbig(7), Grau(8), Hellglänzend(9), Gelb(10), Gesamt(11), Insgesamt(12)

Table 3 shows average body measurements for the Zagorje turkeys examined at an average age of 10.5 months, which means that skeleton growth was completed and that the results may be compared with those of *Kodinetz* from 1940. At that time the birds presented the body measurements shown in *Table 3*.

The comparison of the Zagorje turkey measurements from 1937 and 1999 shows that the body lengths are quite similar and that the present-day hens feature a somewhat narrower body. The breast bone length of the current population is some 1.5 cm longer and the breast depth of the 1999 hens is, on average, 0.7 cm larger.

Table 2

Weight of adult birds, annual laying rate and number of young turkeys per hen

Sex (1)	Statistical indicator (2)	Body weight in kg (3)	Annual laying rate No. of eggs(4)	Young turkeys per hen/year(5)
♂	n	159	-	-
	☒	6.87	-	-
	S	1.27	-	-
	V	18.48	-	-
♀	N	594	159	159
	☒	3.97	20.68	16.69
	s	0.63	0.54	8.66
	V	19.90	46.72	51.89

2. Tabelle: Gewicht der aufgezogenen Truthühner, jährliche Legeleistung, aufgezogene Küken pro Truthenne

Geschlecht(1), Statistische Kennziffer(2), Körpergewicht(3), Jährliche Legerate, Eierzahl(4), Aufgezogene Küken pro Truthenne(5)

Table 3

Zagorje turkey body measurements in 1999 and 1937

Sex (1)	Statistical Indicator (2)	Body(3)				Breast(6)			
		Length cm(4)		Width cm(5)		Breast bone length cm(7)		Breast depth cm (8)	
		1999	1937	1999	1937	1999	1937	1999	1937
♂	N	159	48	159	48	159	48	159	48
	☒	29.80	29.06	9.98	10.61	16.35	14.06	20.53	20.47
	S	2.31	0.26	0.97	0.34	1.38	0.24	1.61	0.28
	V	7.75	0.91	9.73	3.23	8.44	1.77	7.87	1.4
♀	N	594	70	594	70	594	70	594	70
	☒	24.40	24.44	8.81	9.43	12.71	11.76	15.70	16.40
	S	1.42	0.29	0.92	0.19	1.14	0.16	1.11	0.23
	V	5.85	1.21	10.53	2.06	9.04	1.33	7.09	1.4

3. Tabelle: Körpermaße der Zagorianer Truthühner 1999 und 1937

Geschlecht(1), Statistische Kennziffer(2), Körper(3), Länge(4), Breite(5), Brust(6), Brustbeinlänge(7), Brusttiefe(8)

CONCLUSIONS

The number of the current population of the Zagorje turkey reproduction flock is estimated at as few as 1500 birds, which is about 18 times fewer than in 1937.

The external features of the Zagorje turkey, body length and width, breast bone length and breast depth of the remaining population did not change even slightly in the period between 1937 and 1999.

REFERENCES

- Crawford, R.D., (1992). Introduction to Europe and Diffusion of Domesticated turkeys from the America. *Archivos de Zootecnia*, 41. 154. 307-314.
- Kodinetz, G., (1940). Beitrag zur Kenntnis der Rasse und der Entwicklung des Zagorianer Truthuhnes (*Meleagris gallopavo*). *Zeitschrift für Tierzüchtung und Züchtungsbiologie*, 47. 2. 140-165.
- Nixey, C.; Grey, T.C., (1989). Recent Advances in turkey Science, Poultry Science Symposium Number Twenty-one, 11-30. Butterworth & Co. Ltd. England.

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