CONSERVATION OF BIODIVERSITY IN ITALIAN POULTRY BREEDS:
deepening and monitoring
TuBAvI-2

Breed data sheet

MODENESE

Gallus gallus domesticus Sp.

Origin and morphological, genetic, reproductive, and productive traits

FONDO EUROPEO AGRICOLO PER LO SVILUPPO RURALE: l'Europa investe nelle zone rurali

MINISTERO DELL'AGRICOLTURA DELLA SOVRANITÀ ALIMENTARE E DELLE FORESTE

The presented data were registered in the nucleus population
conserved at the University of Parma,
Department of Medical-Veterinarian Sciences.

Latest update: June 4th, 2024

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Breed origin and development

Name of the breed	Modenese
Synonyms or local names	Gallina modenese, Fulva di Modena
Geographic origin	Province of Modena
Geographic distribution	Countryside around Modena
Estimated total population size	20 (Castillo et al., 2021)
Extinction risk status (FAO, 1998)	Critical
Any other specific information	Medium to large-sized breed

Historical origin
Historically present in the Province of Modena, the *gallina Modenese* (Modenese hen) is cited in several assays as a local breed. Important proofs of the long-standing presence of this breed in Emilia's countryside are represented by the many paintings by the painter Gaetano Chierici (1838-1920) and by the painter and photographer Eugenio Zampighi (1859-1944), that immortalised these birds. These seem to confute the recent hypothesis according to which the origin of the Modenese breed should trace back to crossbreedings of White Livorno, Gold Livorno and *Padovana comune* (*Megiarola migliorata*) chickens performed in the 1940s, but cannot rule out the possibility that these breeds may have been used to improve egg laying attitude. Up to a few decades ago, the Modenese breed was spread in the countryside and appreciated for both meat and eggs. However, the recent diffusion of fast-growing, more profitable hybrids have gradually reduced its numerousness. The extinction of the breed was prevented by the Serafini family, from Nonantola, that maintained a few pure breed birds, and by their collaboration with prof. Zanon, from the University of Parma, that led to the creation of a specific project aimed at studying the breed.

Qualitative and quantitative morphological traits in adult breeders

Discrete or qualitative traits

Feather morphology	Normal
Feather distribution	Normal
Plumage structure	Well adherent, soft
Plumage colours	Wheaten gold (*Dorata frumento*), Golden wild type (*Selvatica oro*) Other colours reported in the past: White, Black, Blue (ash grey), *Cucula* (grey), Very light fawn (yellow), and Wheaten (pencilled fawn)
Colour features	Multicolour, with sexual dimorphism
Chick plumage colour	
Comb type	**Simple comb**, large, held upright in the male, falling to one side in the female, especially in early oviposition
Comb spikes	Six spikes or more
Ear-lobe colour	Pure white, cream white, or ivory white
Beak colour	Yellow, sometimes turning to horn in the upper part
Iris colour	Orange-red to brown
Muffs	Absent
Beard	Absent
Tuft	Absent
Skin colour	Straw to intense yellow
Shank colour	Yellow
Shank feathering	Free from feathers
Skeletal variants	-
Other specific and distinct visible traits	Strongly developed wattles

Colour pattern
Wheaten gold: in the **male**, head red brown, cape and saddle gold brown, lighter in the lower part. Cape is free from black striping. Back, shoulders, and small coverts chestnut-brown. Wing bar black with green sheen. Primaries blackish, secondaries inner web blackish, outer web brown forming wing bay. Breast, belly, and thighs black with green sheen. Tail black with green sheen. In the **female**, head wheaten to hazel. Cape uniform gold brown, some striping is admitted. Breast wheaten. Belly and thighs hazel-wheaten. Back and rest of the plumage wheaten. Wing bay a little darker. Black permitted in inner barbs of the remigees. Tail feathers grey-black shaded with brown. Tail coverts wheaten. An overall darker colour pattern is permitted. **Golden wild type**: In the **male**, head golden-yellow, with cape that can be both golden-yellow lighter in the lower part and uniform golden-yellow with black striping. Back, shoulders, and wing coverts brilliant dark red. Hackles golden-yellow with black striping. Main wing coverts black with metallic blue/green sheen. Primaries black, with narrow brown edging on the outer web. Secondaries inner web and point black, outer web brown

forming the wing bay. Breast black with green sheen free from traces of brown. Belly and thighs black. Tail black with strong green sheen. Down greyish. In the **female**, head golden-yellow, cape golden-yellow with black striping. Overall plumage brown-gold with coarse black peppering and slightly lighter rachis. Primaries black with narrow light grey edging on outer web. Secondaries inner web grey and outer web peppered grey. Breast salmon. Belly and thighs brown-grey. Tail black, main tail coverts marked like the rest of the plumage.

Quantitative traits

Body weight, male (g, min-max)	2500-3200
Body weight, female (g, min-max)	1900-2600

Rearing traits

Breed type	Mediterranean chicken, rustic and reactive; lively and wild, little suitable to indoor rearing
Growth speed (precocious *vs* tardive)	
Feathering speed (precocious *vs* tardive)	Precocious
Broodiness	Scarse
Parental care attitude	
Ease of breeding	No, very wild breed
Male:female ratio for breeding	
Tolerance or resistance to diseases and parasites	
Tolerance to extremes of temperature	
Reported uses (meat, eggs)	Primary: eggs Secondary: meat

Genetic traits

Characterisation of the breed with Single Nucleotide Polymorphisms (SNPs)

Molecular marker	Affymetrix Axiom 600K Chicken Genotyping Array
Laboratory that performed the analyses	Department of Agronomy, Food, Natural Resources, Animals and Environment (DAFNAE) University of Padua
Analysed parameters	MAF: minor allelic frequency Ho: observed heterozygosis He: expected heterozygosis F_{HOM}: inbreeding coefficient

Year		N**	MAF	Ho	He	F_{HOM}
2019	Mean	24	0.273	0.260	0.27	0.296
	SD*		0.252	0.197	0.181	0.083

*SD: standard deviation; **N: number of samples

Characterisation of nucleus populations with microsatellites and mating plans

Molecular marker	Microsatellites (26 markers)
Laboratory that performed the analyses	Laboratory of Animal Molecular Genetics Department of Veterinary Science (DSV) University of Turin
Analysed parameters	Ne: effective number of alleles Na: observed number of alleles I: Shannon diversity index H-Ind: individual variability index Ho: observed heterozygosis (average H-Ind) He: expected heterozygosis F: fixation index P: average kinship index
Indexes used to schedule mating plans	H-Ind P

Year		N**	Na	Ne	I	Ho	He	F	P
2024	Mean	11.327	2.731	1.975	0.718	0.411	0.431	0.034	0.61
	SE*	0.337	0.138	0.091	0.050	0.032	0.029	0.036	0.01

*SE: standard error; **N: number of samples

Reproductive and productive quantitative traits

Oviposition, brooding and incubation data

Age at sexual maturity of hens (weeks)	N.a.**
Length of first oviposition cycle (weeks)	38
Average annual egg production per hen*	102
Average clutch size (min-max)	N.a.**
Clutch interval (days)	N.a.**
Incubation length (days)	N.a.**

*As measured during the first year of age, min-max of family line
**N.a.: Not available information

Egg-quality traits

Parameters	First oviposition cycle*	
	Average	Min-max
Egg weight (g)	53.73	29.8-82.4
Shell colour	Dull white	

* Total n. of measured eggs: 1549

Parameters (sample measurement)	Average	Min-max
Egg weight (g)	53.73	29.8-82.4
Shell weight (g)	7.17	N.a.**
Albumen weight (g)	27.27	N.a.**
Yolk weight (g)	19.29	N.a.**
Egg Shape Index*	75.61	60.78-94.23

* Egg Shape Index (ESI) = short diameter/long diameter x 100
**N.a.: Not available information

Reproductive traits

Incubation parameters	First oviposition cycle
	Average
Fertility (% produced eggs)	84.82
Hatchability (% fertile eggs)	89.62
Hatchability (% produced eggs)	76.02

*Per family line

Body weight and growth data

Age (weeks)	Average	
	Male weight (g)	Female weight (g)
0 (hatching)	35.3	35.4
8	124.5	123.6
12	418.3	406.3
16	1090.1	956.3
26	1487.6	1291.4
34	1866.6	1683.3

Slaughter data (age: 210 days; males)

Slaughter parameters	Average	SE*
Live weight (g)	2142	35
Carcass weight (eviscerated) (g)	1357	
Carcass weight (eviscerated) yeald (%)	63.33	

*SE: standard error

Modenese male and female

Wheaten gold

Avian Center for the Conservation
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