

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



Breed data sheet

BIONDA PIEMONTESE

Gallus gallus domesticus Sp.

Origin and morphological,
genetic, reproductive,
and productive traits



FONDO EUROPEO AGRICOLO PER LO SVILUPPO
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MINISTERO DELL'AGRICOLTURA
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E DELLE FORESTE





The presented data were registered in nucleus populations conserved at the University of Turin (UniTO).

Latest update: February 17th, 2023



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Breed origin and development

Name of the breed	Bionda piemontese
Synonyms or local names	Bionda di Villanova, Bionda di Cuneo, Rossa delle Crivelle, Nostralina
Geographic origin	Piedmont
Geographic distribution	Piedmont
Estimated total population size	3400 (Castillo et al., 2021)
Extinction risk status (FAO, 1998)	Not at risk
Any other specific information	Dual purpose free-range breed

<p>Historical origin</p> <p>Bionda Piemontese is a local poultry breed distributed throughout the Piedmont region since 1930s. The first evidence of its presence can be traced back to 1938, when prof. Vittorio Vezzani, Director of the Experimental Poultry Center in Turin, described its features and started a breed selection project. In the first post-world war period, Bionda Piemontese was almost abandoned, due to its substitution with fast growing hybrid lines as a main consequence of industrialization and intensive agriculture systems. Fortunately, since 1999, the Professional Institute for Agriculture and Environment of Verzuolo (CN) has started a recovery project for this slow growing breed, leading to the creation of a breed standard, approved by the Italian Federation of Poultry Associations (FIAV) in 2007. Bionda Piemontese was a Slow Food presidium until 2017. Since 2014, the University of Turin has started a programme of conservation and genetic improvement.</p>
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Qualitative and quantitative morphological traits in adult breeders

Discrete or qualitative traits

Feather morphology	Normal
Feather distribution	Normal
Plumage structure	Thick and well adherent to the body, abundant cape
Plumage colours	Fawn/golden, with coloured tail
Colour features	Bi-colour, with sexual dimorphism
Chick plumage colour	Yellow
Comb type	Simple comb , red; in the male it is upright, in the female the rear part falls to one side
Comb spikes	Four to seven spikes
Ear-lobe colour	Cream white to yellow (red permitted); well-developed in the male
Beak colour	Yellow
Iris colour	Orange
Muffs	Absent
Beard	Absent
Tuft	Absent
Skin colour	Yellow
Shank colour	Yellow
Shank feathering	Free from feathers
Skeletal variants	-
Other specific and distinct visible traits	Red, well-developed wattles

Colour pattern
In the male , fawn plumage (chamois to golden) with black/blue/white feathers in tail and wings; primaries can be the same colour as the tail. In the female , golden fawn plumage, lighter after the first moult, with black/blue/white feathers in the tail; the cape can show a black edging.

Quantitative traits

Parameters	Male		Female	
	Average±SD*	Min-max	Average±SD*	Min-max
Body weight (g)	2596±186	2420-2946	2082±162	1894-2430
Body length (cm)	46,2±1,6	43-49	40,3±1,5	38-42
Chest circumference (cm)	34,7±1,1	33-37	32,0±1,1	30-34
Shank length (cm)	9±0,2	8.5-9,5	7,8±0,3	7-8
Shank diameter (cm)	1,1±0,1	1,0-1,2	0,8±0,1	0,6-0,9
Wing span (cm)	41,8±1,5	39-44	36,7±2,3	32-41

*SD: standard deviation

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 heterozygosity He: expected heterozygosity F _{HOM} : inbreeding coefficient

Year		N**	MAF	Ho	He	F _{HOM}
2019	Mean	22	0.283	0.325	0.317	0.116
	SD*		0.210	0.186	0.164	0.025

*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 heterozygosity (average H-Ind) He: expected heterozygosity 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
2020	Mean	69	5.286	3.358	1.312	0.683	0.683	0.003	0.45
	SE*		0.667	0.240	0.079	0.055	0.022	0.068	
2022	Mean	39	4.35	2.90	1.10	0.56	0.58	0.07	0.49
	SE*		0.38	0.24	0.09	0.05	0.04	0.04	0.02

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

Reproductive and productive quantitative traits

Oviposition, brooding and incubation data

Age at sexual maturity of hens (weeks)	24-28
Length of first oviposition cycle (weeks)	45
Annual egg production per hen (min-max)*	150-180
Average clutch size (min-max)	N.a.**
Clutch interval (days)	N.a.**
Incubation length (days)	21

*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*		Second oviposition cycle**	
	Average	Min-max	Average	Min-max
Egg weight (g)	55.8	42.8-66.8	63.6	46.6-68.8
Shell colour	Cream white-pink			

* Total n. of measured eggs: 14587; ** Total n. of measured eggs: 6133

Parameters (sample measurement)	Average	Min-max
Egg weight (g)	60.2	52.9-65.2
Shell weight (g)	8	6.3-9.6
Albumen weight (g)	33	25.8-37
Yolk weight (g)	19.4	17.8-20.9
Egg Shape Index*	75	71.9-80.3

* Egg Shape Index (ESI) = short diameter/long diameter x 100

Body weight and growth data

Age (weeks)	Male weight (g)		Female weight (g)	
	Average	SD*	Average	SD*
0 (hatching)	38.69	2.92	39.11	2.72
8	787.09	98.53	667.06	82.49
12	1222.44	151.49	948.56	104.86
18	1710.48	224.59	1362.80	176.42
26	2307.30	294.51	1733.11	251.84
30	2450.25	283.28	1798.27	284.95
34	2474.81	290.48	1818.94	275.37

*SD: standard deviation

Mortality

Age (weeks)	Average (%)	
	Male	Female
0-1	0.1	0.1
1-8	0.05	0.05
8-20	0.01	0.01
20-34	0.01	0.01

Slaughter data (age: 5 months)

Slaughter parameters	Male		Female	
	Average	SD*	Average	SD*
Live weight (kg)	2.9	3.0	2.0	2.4
Carcass weight (eviscerated) (kg)	1.8	2.0	1.3	2.0
Carcass weight (eviscerated) yeald (%)	62		65	

*SD: standard deviation

Rearing traits

Breed type	Rustic, rural, lively
Growth speed (precocious vs tardive)	Tardive
Feathering speed (precocious vs tardive)	Precocious
Broodiness	Low
Parental care attitude	Low
Ease of breeding	Easy
Male:female ratio for breeding	1:10
Tolerance or resistance to diseases and parasites	Good
Tolerance to extremes of temperature	Good
Reported uses (meat, eggs)	Primary: meat Secondary: eggs

Bionda piemontese male and female



Centre for the Conservation of Local Poultry Genetic Resources, UniTO



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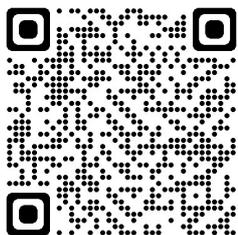
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