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INTRODUCTION

About 6,500,000 hunters live in the countries of the European Community; mostly in France (1,880,000), Italy (1,500,000), Spain (1,050,000), and Great Britain (800,000); they are less numerous in Portugal and Greece (300,000), GDR (265,000) and Denmark (170,000); very few are found in Holland (36,000), Belgium (29,000) and Luxembourg (2,600) (12). As can be seen, in some countries the number of hunters is very high. The highest density is in Italy: nearly 5 hunters per Km², followed by Denmark, France, Portugal and Great Britain: 3.8-3.3, Hunters /Km² and, finally, Greece, Spain, GDR, Luxembourg, Belgium and Holland 2.2-0.8 Hunters/Km². The density is so high that the natural reproduction of game is insufficient to satisfy the hunters' requirements. It is quite difficult to evaluate exactly the number of animals bred and imported or exported by each country to increase the amount of their game. Of considerable interest however are the data referring to the national cost of hunting since most of this money is spent to increase the amount of game by the introduction of artificially bred animals. In relationship to the number of hunters, the nation which invests most money is Belgium with 62.5 million ECU (1 ECU is about 2.02 marks) then Denmark with 170 million, Luxembourg with 2.6 million, Holland with 36 million, W.Germany with 265 million, Britain with 720 million, France with 752 million, Greece with 120 million, Italy with 600 million, Spain with 420 million and Portugal with 120 million (12).

Regarding the amount of artificially bred animals, in Italy the available data refer to an evaluation by the Association of Game Bird Producers in 1980. They report that the annual production of private game-reserves alone is about 2,800,000 animals (19). Recent evaluations (1) report a production of 18 million animals (mostly - about 80% - pheasants) on all game breeding farms but this production isn't sufficient to cover Italian requirements. Italy in fact imports more than 800 tons of live wild-animals a year, mainly from East European Countries (1). In spite of the large number of wild animals killed in Italy (more than 120 million according to an evaluation of the Italian branch of the World Wildlife Fund based on the production of cartridges for hunting: 600 millions by the arms industry during a hunting season) (16) there also exists an importation of dead game indicating that the quantity of animals killed in Italy is insufficient to satisfy consumer demand - table 1 -.

Since pheasant breeding farms are the most widespread type of game farms in Italy, we'll describe the present Italian pheasant breeding systems underlining their negative aspects and noting possible developments in techniques.

BREEDING TECHNIQUES

Pheasants are characterized by a notable capacity of adaptation to different conditions and by their ability to survive in the wild. The breeding period can be divided into two phases: the breeding of the adult (cocks and layers) and the breeding of the growing pheasants.

- Table 1 -

Italy dead-game import: from Lucifero and Biagioli, 1987 (13)

Species	Quantity Value	1981	1983	variation %
Non specified Wild animals	quantity Kg	2,718,702	2,949,460	+ 9
	value ECU	6,549,273	6,385,412	- 2
Wild boar	quantity Kg	647,427	1,050,390	+ 62
	value ECU	1,043,032	2,240,338	+115

Breeding of adult pheasants

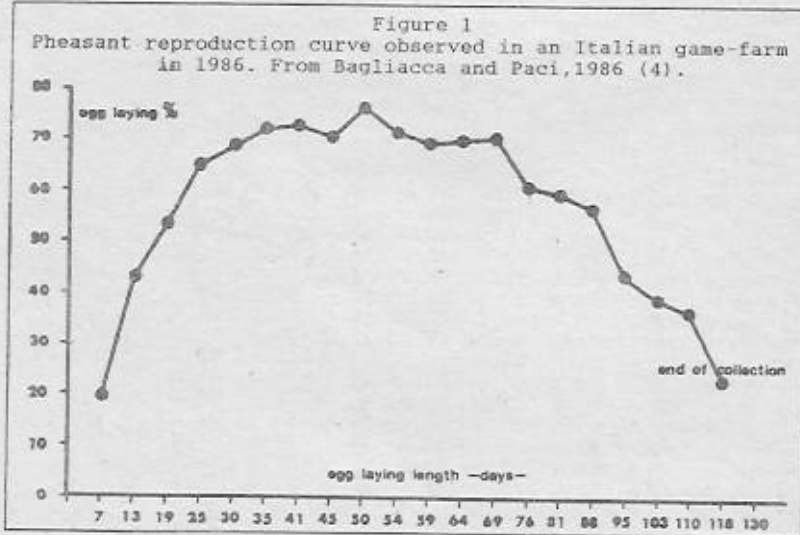
The reproducers are usually chosen from among the first birds born the previous year. The criteria of selection are the following: plumage colour, robustness, healthiness, quantity and length of plumage, temperament and wildness. Some breeders also choose the pheasants according to their aptitude for being bred in captivity and according to their egg production. Selection of pheasants to increase egg production isn't difficult and gives excellent results (6,7,10,15) but since, in birds, egg production has a negative correlation to clutch aptitude, this criterium should not be employed to produce birds for reintroduction but only for the production of the "ready to hunt bird" (18). In addition, since there is a close correlation between aggressiveness and high egg production (11), we exacerbate the tendency to feather peck. Selection according to the phenotypic criteria may also cause problems. In fact we always discard pecked birds and, by choosing the aggressive ones, we increase the social dominance and consequently the aggressiveness of the groups.

The reproducers are bred in families: in pens on the ground or in cages. The composition of a family is one male and 5-7 females. Density may vary from 0.3 to 1.5 pheasant/m² in pens and from 0.5 to 2.5 pheasant/m² in cages (2,14,19). Recently in Italy some farms have started to breed the pheasants in colonies (8-16 males with 50-100 females) in pens on the ground; in this case the density may vary from 0.9 to 1.6 pheasant/m². The use of the colony instead of the family seems to increase the fertility percentage of the first laid eggs and, in this density condition, the presence of more than one male in the same pen doesn't seem to increase aggressiveness (2). In all cases the females are beak-trimmed when placed in the reproduction pen and they are equipped with blinkers or beak-guards. Also males, when placed in the reproduction pen, are not only beak-trimmed but also spur-trimmed and they may be fitted with the beak-guards but never the blinkers.

The collection of the eggs takes place twice a day in the pen and once a day in the cages, where the laid eggs roll out on

the egg floors. The eggs are cleaned if necessary, fumigated with formaldehyde gas, and stored for a maximum period of 7 days in rooms where the temperature is 12-15°C and the R.U. 65-80%.

The egg production curve is characteristic of the species and depends on the season. It is characterized by a progressive increase during the first 4-6 weeks, followed by a stable period of 3-5 weeks, corresponding to the maximum egg laying rate, and a period of decrease of 9-11 weeks - figure 1 -. In Italy the laying period in natural light starts in March-April and ends in June-July, but may be anticipated very easily by simply prolonging the daylight (4,17). Egg production varies greatly from farm to farm and from bird to bird: farms which don't choose birds according to their egg production have an avg. production of 40-60 eggs/female but this can reach an avg. of 80-100 eggs/female (6,7,15) in farms where the hens are selected for their egg production. Mortality during egg laying is greatly variable and mainly due to cannibalism. The incidence of cannibalism is higher in cages than in pen but the incidence of diseases in cages-reared pheasants is generally lower. Lost percentages of 5-10% must be expected (2,17,19).



Hatchability in farms which use forced-draught, all automatic chicken-egg type "Victoria" incubators for the first 21 days (turning angle = $\pm 60^\circ$, temperature = $37.8 \pm 0.2^\circ\text{C}$ and R.U. = 65-70%) and lateral ventilator "Victoria" hatchers for the remaining 3-4 days (temperature = $37.2 \pm 0.2^\circ\text{C}$, R.U. = 80-90%) reaches levels of 70-90% - table 2-. The main causes of non-hatching are the non-fertilization of the egg - 9-30% - and the embryo mortality - 5-20% - (table 2).

Breeding of growing pheasants

Early in their life the young pheasants need high temperatures and a protein rich feed. They are therefore bred on wooden shaves in poultry houses (often small poultry houses: 70-100 m² with a maximum of 2,000-3,500 birds); they are artificially heated for the first 4 weeks, at which age the gas heaters are lit only at night. The light is always on but the intensity is very low (5-15 lux) and red bulbs are often used. High light intensity in this period characterized by high density conditions, cannot be used since it excites the birds and stimulates pecking. The density in this period may vary from 50-100 birds per m² in the first week to 10-20 birds per m² in the fourth week (2,14,19).

- Table 2 -

Fertility and hatchability of pheasant eggs observed in an Italian game-bird farm during 5 years (2).

NUMBER OF INCUBATED EGGS PER YEAR									
48,948		57,187		57,845		57,494		62,903	
START AND END OF THE INCUBATION SEASON (the eggs were stored for variable periods: 3 through 9 days)									
14 March through 1 July 1985		3 March through 8 July 1986		28 March through 14 July 1987		8 March through 9 July 1988		8 March through 28 June 1989	
fert.hatch. % %		fert.hatch. % %		fert.hatch. % %		fert.hatch. % %		fert.hatch. % %	
53.9	85.8	60.6	81.2	65.2	80.9	54.5	84.8	63.4	70.9
70.2	85.8	76.0	91.6	79.5	78.8	79.1	85.4	88.2	81.8
69.7	87.5	81.0	84.0	83.2	82.6	81.4	88.3	85.0	84.0
72.6	89.2	82.9	85.7	83.8	80.5	78.1	83.2	78.9	82.3
76.2	83.5	82.1	86.5	85.4	83.7	77.3	86.0	83.6	80.0
77.8	84.7	82.9	87.6	85.6	81.6	79.6	81.6	81.5	79.7
75.9	89.7	84.2	89.9	85.9	83.1	79.6	81.8	84.7	84.0
77.2	90.0	82.3	88.2	85.2	83.8	82.2	79.0	85.8	81.1
76.5	88.6	79.7	87.2	85.7	83.3	82.8	80.3	83.4	79.9
75.9	90.3	86.7	85.9	85.8	83.3	79.8	81.4	89.1	80.9
76.6	83.2	85.9	89.0	87.3	82.9	80.5	77.0	93.1	78.9
74.8	87.6	84.4	85.0	85.4	87.5	77.4	80.0	85.9	83.2
72.2	87.0	84.6	90.9	86.8	87.9	79.7	77.5	87.9	79.5
73.5	88.9	85.9	89.5	84.1	90.8	76.7	80.6	88.8	77.0
69.3	87.5	85.1	83.2	81.2	83.9	73.3	79.7	86.5	76.9
69.2	86.8	81.8	87.3	79.5	85.7	70.0	74.2	84.0	81.1
66.0	86.3	75.5	81.7	77.2	82.0	65.8	80.8	83.7	77.6
59.6	85.0	76.1	85.3	73.1	79.5	59.7	82.9	81.0	82.1
57.8	83.2	75.6	85.0	50.7	80.0	55.7	79.5	75.0	77.9
48.7	72.8	52.9	70.6	38.5	69.4			75.3	77.9
		37.8	76.3					70.1	61.8
								63.6	74.2

From the third to the fourth week, some breeders who can use the lower density allow the pheasants access to special intermediate flying pens which must be well grassed and where the density must not exceed 3-5 birds/m². Most breeders, however, since cannibalism decreases with age as mature plumage is achieved (9), rear the pheasants inside the darkened poultry houses since they have a tail 7-8 cm length. In any case when the pheasants are allowed to access to external pens, they are treated to forestall pecking: for this purpose beaks are trimmed and/or blinkers or beak-guards are fitted. Recently (3) the use of lithium in the feed has been studied to reduce aggressiveness but, apart from the problem of meat and bone Li-residues, it must be used together with other anti-pecking devices, and the Li-feed content must be changed during pheasant growth.

At 30-50 days old, the pheasants are allowed to go to the big flying pen where a density of .2-3 birds/m² is maintained. From the age of 80-90 days they are sold for the hunt or for repopulation. The imperfectly feathered birds and the lame and those with neck distortions are usually slaughtered for direct consumption.

Mortality in growing pheasant is quite variable and related to breeding density and changes in the weather. Lost percentages of 10-15% must be expected (2,19). Regarding prophylaxis, current practice is to vaccinate the young pheasant against N.D.. Usually all pheasants are vaccinated, via drinking water, between 12-15 days of age and again at 30-40 days of age. Pheasants chosen for reproduction are usually vaccinated again at 90 days of age or when placed in the reproduction pen. Some breeders vaccinate the future reproducers against infectious bronchitis too. Control of coccidiosis is normally carried out by continuous medication with anticoccidial in the feed (19).

Feeding techniques

From an alimentary point of view in Italy the period of rearing of the young pheasants is divided into two or more sub-periods and the period of adult rearing is divided into 2. So the breeding farms use at least 4 different feeds, always ad libitum distributed, which are changed as follows:

1st period of growth from 1 to 35 days old; feed generally takes the form of crumbles. This period may in turn be divided into two sub-periods from 1-14 days (starter) and from 14-28/35 days (rearer) where the former is usually characterized by a higher protein content.

2nd period of growth from 28 to 60-90 days old; feed generally takes the form of small pellets. Here too, two subdivisions may be employed: up to 60 days, over 60 days. Here again the feed given to the younger birds contains more protein. In addition, some breeders spread cereals in the flying pens after 60 days, in order to accustom the pheasants to the food that they will find in the wild.

Breeding the reproducers: after 90 days, and in some cases, after 70 days (very grassy and low density flying-pens) the feed is given in the form of pellets.

Laying period: the feed is given starting from 20-30 days before the anticipated laying of the first eggs till the completion of laying. This feed too is usually given in the form of pellets.

As far as the formulation is concerned, a 1987 research study to check the most commonly used feeds in Italy showed that they almost always satisfy the requirements set out in the literature, although they vary considerably (see table 3)

- Table 3 -

Chemical composition and Energy content of Italian feed for intensively bred pheasants; from Serardelli et al., 1987 (8).

PARAMETERS (a)=avg. ± st.dev. (b)=extreme values	GROWING		
	LAYING	1ST PERIOD	2ND PERIOD
ANALYSED FEED....n.	14	19	14
CRUDE PROTEIN....%	(a) 19.00± 1.65 (b) 15.08±21.16	25.85± 2.04 22.11±30.13	22.36± 2.77 18.77±29.60
ETHER EXTRACT....%	(a) 3.14± .77 (b) 2.24± 4.88	3.14± .64 1.90± 4.33	3.02± .74 1.82± 4.33
CRUDE FIBER.....%	(a) 4.80± 1.20 (b) 3.22± 8.03	4.50± .83 3.04± 6.31	4.49± 1.01 2.65± 5.62
ASH.....%	(a) 9.13± 1.50 (b) 6.63±11.70	7.50± 1.04 5.95±10.03	7.26± 1.27 5.46± 9.54
N-FREE EXTRACT...%	(a) 51.94± 2.02 (b) 48.61±55.74	47.01± 2.95 41.16±51.17	50.86± 3.72 41.16±55.91
Ca.....%	(a) 2.31± .81 (b) 1.18± 4.31	1.47± .36 .99± 2.42	1.39± .40 .91± 2.04
P.....%	(a) .87± .12 (b) .70± 1.07	1.00± .16 .84± 1.29	1.00± .15 .76± 1.23
METABOLIZABLE...MJ ENERGY	(a) 11.93± .46 (b) 11.09±12.87	12.32± .41 11.43±13.01	12.33± .55 11.32±13.23

CONCLUSIONS

On the basis of the data given above, we can draw some conclusions of general interest.

Game breeding, and particularly pheasant breeding, despite its highly developed state, is insufficient to satisfy the requirements of Italian hunters, resulting in the existence of large-scale importation. This importation will tend to decline due to the fact that the sale of game is only a small part of the business related to hunting, and it is therefore more remunerative for the producing nations to import "live hunters" rather than export "live birds", since the associated business is greater than that entailed in the simple sale of animals.

It is therefore in the interest of all countries to increase the home production of game and to export perhaps only dead animals, which might be reared expressly for this purpose or derive from the hunting activity within the producing nation.

With regard to breeding technologies, productivity can be notably increased by the adoption of new technologies deriving mainly from those used in domestic type intensive breeding. But the reason for which these animals are bred must always be kept in mind so that we can avoid dangerous drops in quality of the product both from the meat quality, but above all from the hunting point of view.

SUMMARY

Following an introduction in which the high density of the European hunters is related, the present Italian pheasant breeding systems are described. Their negative aspects are underlined and possible developments in techniques are noted.

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REFERENCES

- 1 -Anonimus (1986) L'allevatore 42(18/19):10.
- 2 -Bagliacca M. (1988-1989) Personal data.
- 3 -Bagliacca M., Cardini G. Ducci M. (1988) Lithium and pheasant aggression - Proc. 18^o World's Poultry Congr.:770-772.
- 4 -Bagliacca M., Paci G. (1988) Sostituzione dei maschi durante la stagione riproduttiva e performance delle fagiane. Ann. Fac. Med. Vet. Univ. di Pisa 39: 137-146.
- 5 -Benassi M.C., Berardelli C. (1989) L'allevamento della selvaggina: importanza zootecnica. (in press).
- 6 -Benatti G., Zoccarato I., Pagano Toscano G. (1985) Possibilità di miglioramento della produzione delle uova nel Phasianus colchicus Mongolicus (Brandt). Riv.di Avic. (2):33-39.
- 7 -Benatti G., Zoccarato I., Pagano Toscano G. (1986) La produzione di uova di Phasianus colchicus mongolicus. Riv di Avic. (3):66-68.
- 8 -Berardelli C., Benassi M.C., Gubellini M. (1987) Indagine sulle caratteristiche di mangimi commerciali per volatili selvatici di interesse faunistico-venatorio. Riv. di Avic. (6):29-36.
- 9 -Cain J.R., Weber J.M., Lockamy T.A. and Gregor C.R. (1984) Grower diets and bird density effects on growth and cannibalism in ring-necked pheasants. Poult.Sci 63: 450-457
- 10-Carpenter G.H. and Flegal C.J.(1981) Improving egg production in ring-neck pheasants. Poult.Sci. 60: 1635.
- 11-Houghes B.O. and Duncan J.H.(1972) The influence of strain and environmental factor upon feather pecking and cannibalism in fowls. Br.Poult. Sci 13: 525-547.
- 12-Lombardi M.(1988) La caccia nei paesi della Comunità Europea. Diana (3): 8-9.
- 13-Lucifero M., Biagioli O. (1987) Quale indirizzo per gli allevamenti faunistici? Proc. IX Cong. Allevamenti selvaggina:63-68.
- 14-Manetti O.(1980) ALLEVAMENTO DEL FAGIANO. Edagricole (Bo).
- 15-Melin J.M. (1987) Intensification de la production de faisandeaux. Seance de travail bienale de la Station de Recherche Avicoles de Nouzilly avec le concours de groupe Francais de la W.P.S.A.. Nouzilly 8-9-Oct.1987
- 16-Modugno B.(1989) I censimenti degli Anticaccia. Diana (1):15.
- 17-Monetti P.G., Castaldini S., Ravaioli C., Benassi C. (1985) Effetti esercitati dall'impiego di mangimi a diverso tenore proteico sulle prestazioni riproduttive di fagiani in deposizione anticipata. Zoot.Nutr. Anim. 11: 155-166.
- 18-Mori B., Bagliacca M. (1987) La starna: ambiente e alimentazione. Proc. IX Cong. Allevamenti di Selvaggina: 47-57.
- 19-Mussa P.P., Debernardi M. (1987) Allevamento e reintroduzione di piccola selvaggina stanziale: situazione attuale e prospettive di miglioramento. Atti IX Con. Allevamenti di selvaggina 85-99.

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