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GAMEBIRDS PRODUCTION FOR HUNTING PURPOSE OR RELEASE INTO THE WILD

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After a picture of the technologies used for the production of game birds, the author tries to define and differentiate the game bird rearing technologies in relation to the goal of the production: birds directly slaughtered for production of high quality meat, birds to be used for immediate hunting (after few hours from their release), and birds bred for release into the wild (and hunted eventually only later). Since the technology of production of birds for release into the wild or later hunting must differ greatly from the production of birds for poultry meat, the author underlines the effects of the production technologies on the future behaviour of the birds.

INTRODUCTION

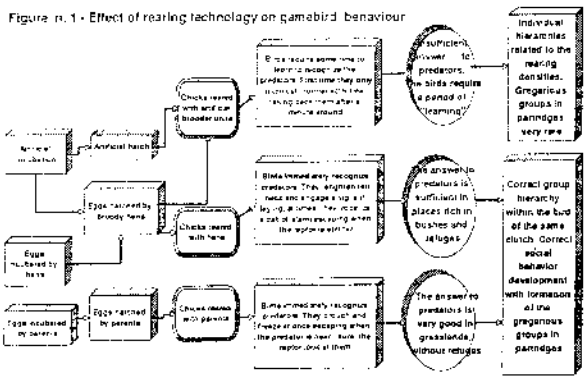
Game bird breeding has been practised to handicraft level with excellent results from times immemorial. The breeding systems, requiring the acquaintance of the "art of rearing game birds", already used by the ancient Romans are completely abandoned today in the industrialised countries. The greater acquaintance about the biology and the physiology of poultry, and particularly the standardisation of the technology of artificial incubation, has facilitated production at, with relative facility, a great amount of pheasants, and partridges (Mussa and Debernardi, 1987). Actually, the "artists" that were concerned with the breeding of game birds can be considered extinct, like the old typical subspecies of wild birds present in the wild. With the modern technologies a constant worsening of the quality of the reared animals is observed. Particularly, the results that the reared animals furnish when they are released in the natural environments, also when the hunt is very quick (few hours after release),are more and more disappointing. In the case of middle term use (hunting after some weeks of life in the wild), the reared subjects are not able to survive, they are scared of man and dogs and have little ability of self-defence. For these reasons the breeding technology used for game bird production cannot be photocopied from the technology used in the industrial poultry production. The intensive production of game birds is valid only on condition that the target be the direct consumption of high quality meat and it cannot be applied to the bird reared for temporary (hunting purpose) or permanent increase in consistence of the wild population. The restoration of the populations of the wild birds, in fact, is not possible by the control of the animals that lives by prying on these birds, put by habitat management and by the transfer of wild birds, naturally produced in other

habitats. Wild birds cannot be imported in sufficient quantity, in addition, different habitats of origin always selects different wild birds. Wild birds coming from far zones can communicate new viral fetters and, wild birds born in other habitats are not equal to their "cousins" from the local, resistance-to-predators point of view. In fact, fully wild birds living in one habitat are much less likely to fall foul of predators than fully wild birds selected in different habitats or hand reared subjects (Wilson et al., 1992). The final and the most important consideration is that birds imported from particular habitats might not have all the necessary genes for the survival in the wild and the control, maintenance and increase of the genetic variability can be easily guaranteed in artificially produced birds (Bagliacca et al., 1995) but cannot be easily controlled in the wild born ones.

BEHAVIOURAL CONSIDERATIONS

An important consideration should be taken before the decision is made as to the technology to adopt for game bird rearing. The breeding is always characterised by peculiar environmental conditions that train the animals! The mother in fact determines the learning and the behaviour of the young birds and can be surrogate, with equal effectiveness, by many natural and artificial substitutes. The phenomenon of the imprinting is well known in birds. Not only substitute mothers but also personnel employed in the breeding farm, artificial stimuli (lights and noises) produced by the hatcheries, hot cages and so on, remain "printed" in the brain of the birds with equal effectiveness to the stimuli produced by the mothers (Lorenz, 1955). The future behaviour of the subjects results therefore modifiable according to the stimuli imprinted. The social behaviour and the answer to predators in the first period of life can be modified by the technology of breeding, as shown in figure 1. The effects of different techniques of breeding on the social behaviour suggests that care should be taken to adopt tested and suitable methods for breeding different species of birds.

Figure n. 1 - Effect of rearing technology on gamebird behaviour



PHEASANTS

The pheasants are the wild birds most easily bred and with the most rapid capacity to adapt and survive to the rigours of the outside world. The breeding period is usually divided into two productive phases: the "reproducers" and the young birds of the year, set for release and/or hunt. Concerning the reproducers, the technology used for their rearing doesn't influence the characteristics of the young pheasants and therefore any rearing method can be chosen according to different situations found suitable (Fig.2). Generally the reproducers, selected from within the first born of the preceding year, are housed, in the ratio of 1 male to 5-7 females, in pens with grass or sandy floor or in batteries with 2-3 decks. In the first case (deep hike-litter)they require from less than 1 sq. m to 2-3 sq. m per bird. In the second case they require generally less than 1 sq. m per bird (Bagliacca, 1989). An alternative to the use of family groups is the use of small colonies (8 males with 50-60 females) reared on the ground at a density slightly greater than the density used for the family groups. The use of colonies, allows a saving of working-time and an automatic selection of the most fertile and dominant males. As a consequence this technology allows an improvement of the fertility of the collected eggs and an increase in the production of the day old chicks (Bagliacca et al., 1990). The use of open air batteries (simply located below a roof), generally allows to get a greater number of eggs per housed female. The photo period manipulation is an interesting technology for the rationalisation of game bird production. The management of photo period influences the seasonal natural reproductive cycle and even to cycle the production to obtain birds all over the year,as can be seen from figure 3 (Bagliacca et al. 1988b; Woodard and Snyder, 1978).

Apart from different and variable responses to light in the case of the two sexes,a disruption of synchronisation with a consequent reduction of egg fertility at the start and at the end of the reproductive cycle, may bring about behavioural changes in the offspring which are probably desirable(Bagliacca and Paci, 1986). As in the case of every other technology used for the improvement of behavioural responses, batteries, cycling of egg laying, egg laying in poultry houses etc. should not be encouraged for the production of birds set for release. Rearing technologies, very distinct from the conditions in which the offspring will live, even if applied only to reproducers, can cause unknown biased effects so that no genetic program,can be correctly applied. For this reason most of the broiler producers have been forced to rear "to the ground" the reproducers in individual selection, despite the notable increase of the costs of management (Chambers, 1990). The collection of the eggs,irrespective of the breading system chosen, must be done at least twice a day, directly from the ground, by means of egg-nets, or from the outside of the cages, whose net floor is correctly tilting. The picked eggs, after cleaning (if necessary) and fumigating (always before storage), must be stored with the small end down in trays with correct holes or with sandy floor to a temperature below the "physiological zero" (18 - 20°C) and at a relative humidity of at

least 60-70%. The storage time, except for the first eggs laid, (usually stored for longer times for reasons of management), should not be more than 5-8 days, to avoid faults of hatchability. Two different systems of production are usually chosen for young pheasants rearing: artificial brooder units or hot batteries with grass runs and/or flying pens, and broody hens with coops and runs. In consideration of the fact that the pheasant is not a gregarious animal, the young birds can be reared separately from true or substitute parents. For this reason the technology of breeding that plans the use of brooding hens is less used and will be described in the paragraph that concerns the breeding techniques for partridges; the technology applied to pheasants differs from the one used in partridges only in respect of the the dimension of the pens (they must be little larger) and for the kind of hen used: "normal" instead of "bantam". In the case of rearing in hot batteries or in artificial brooder units on the floor, the artificial heating period should not be more than 4 weeks, followed by heating only during the night. In order to obtain a better quality of birds, the pheasants must be allowed to go out to grass flying pens from 2 - 3 weeks of life or, at least, the birds should not stay in darkened places beyond 4 - 5 weeks from the birth. All the techniques that include a prolonged rearing period in darkened places, to limit the aggressiveness and allow the increase of bird density (More than 60 young pheasants per sq. m for first 4 weeks) must be completely avoided for the production of subjects for release. The reared groups should be maintained below 450 birds per flying pen or,alternatively, the density should be reduced to less than 1 bird/sq. m, between 30 and 60 days of age and to more than 2 - 5 sq. m/bird, after 60 days of age. All the techniques for the reduction of the aggressiveness,whether chemical or mechanical (Bagliacca et al., 1988a), should be avoided. Blinders, beak-shelters, and beak-rings, used to reduce feather pecking, cause direct morphological and behavioural alterations (figure 4) and would not allow the development of correct individual hierarchies (pecking orders) with consequent strong permanent alterations of natural behaviours. Equally, beak-trimming must be abandoned by game bird breeders for the previous reasons and for legislative reasons concerning the animal welfare (Fetheberg et al., 1993; Muller, 1979). Inorder to acclimatize the pheasants to the environment of the big flying pens, the open air pens can be partially provided with roofs or the big flying pens must be provided with more or less natural covered shelter zones. The flying pen however must be always constructed in a such way that they result in rich vegetation, allowing a certain degree of teaching the birds in feeding natural feed. In consideration to the fact that the pheasants born in captivity usually present a smaller development of the breast muscles in respect of the corresponding wild birds (varying from a minimum of 10% to a maximum of 20%, according to the degree of intensification of the rearing technology) and that, on the contrary, the muscles of the thigh are generally much more developed in the reared pheasants (values of beyond the 30%) (Papeschi and Petrini, 1993), the running of the birds in the flying pen must be reduced as much as possible. For these reasons the flying pen must be at least 4-5 m high and, in addition to the cultivated or natural vegetation present on the ground (grass and shrubs), artificial devices must be placed on the ground to reduce

running and forced the bird to fly only. Since foxes are the predators that affects attack the reared game birds (Hill and Robertson, 1988; Robertson, 1988), the flying pen must be provided with trees in a such way that the pheasants be accustomed to sleep on these since an early age. Even if producers respect all these recommendation they must remember however that the artificially reared birds show a poor reaction to the predators and an insufficient development of the gut (Bagliacca et al., 1996) so that they need a period of gradual adaptation to the life in the wild, to learn to distinguish natural feeds and birds of prey. The correct management of spreading out pens (flying pens without net roofs on release sites) (Straker and Lealand, 1990) by giving a period of gradual adaptation to the life in the wild, drastically reduces the morphological and behavioural defects which characterise the reared birds.

Figure n. 2 - Breeding technology for pheasants'

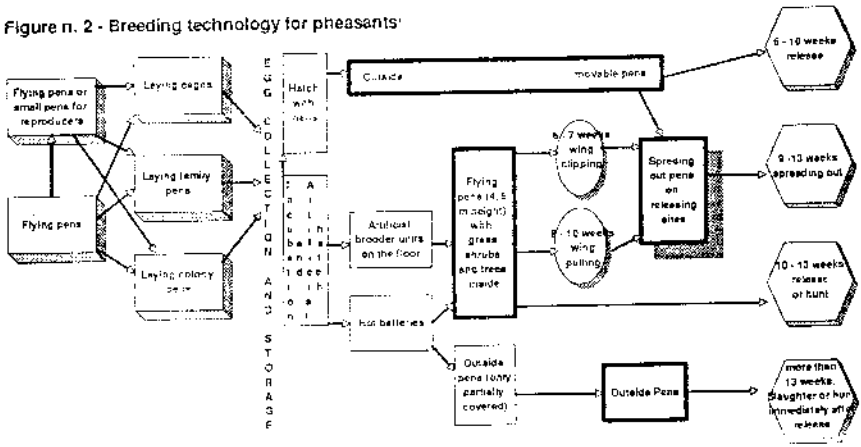
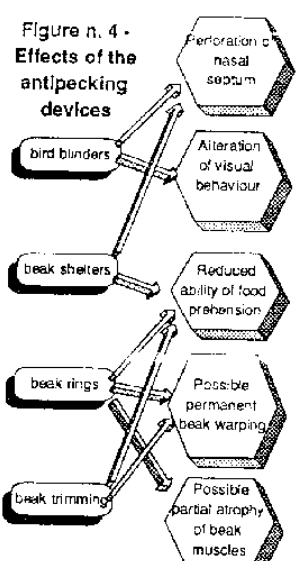


Figure n. 3 - Cycling for gamebird production in boreal Countries.

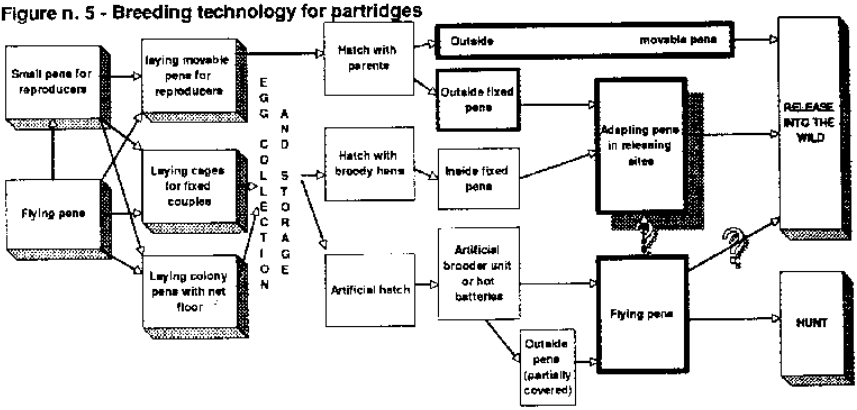
PERIOD	REARING PLACE			LIGHT:DARK L:D
DECEMBER MARCH	1° GROUP		EGG-LAYING	 16L:8D
	2° GROUP		REST-PHASE	 8L:16D
APRIL JULY	1° GROUP		REST-PHASE	 8L:16D
	2° GROUP		EGG-LAYING	 16L:8D
AUGUST [illegible]	1° GROUP		EGG-LAYING	 16L:8D
	2° GROUP		REST-PHASE	 8L:16D



PARTRIDGES

All the different species of partridges are firmly monogamous but it is possible to rear them also in conditions of small colonies with certain productive advantages (Paci et al., 1992a and 1992b). Irrespective of the method of breeding (figure 5), partridges can be bred for more years, until or beyond 5-8 years as opposed to pheasants which are usually bred only for the first year). As with pheasants, the reproducers are generally chosen from the first born of the year before. Although the reproducers can be bred both on ground or on net floor, net breeding is more widely practiced than in pheasants, on account of the reduction of the incidence of parasitism, very dangerous for partridges (Mani et al., 1992). Also in the case of partridge breeding, the technique used for the reproducers would not influence the behaviour of the birds reared for release, except for the unknown biasing effects of intensive breeding technologies on the genetic patrimony of the bred animals.

Figure n. 5 - Breeding technology for partridges



The adoption of pens for the reproduction period of the partridges with the grass floor replaced by a net floor, allows the reduction of the sanitary risks with an unknown increase of the risk of genetic biasing effects. Artificial mothers,(brooders on the ground or heated batteries) can replace the biological mothers exclusively for the production of "ready to be hunted birds". Nevertheless the young birds must be reared in very little groups (not beyond 30 birds/each) and they must be allowed to go out to the grass

flying pen as soon as possible. As for the production of the young birds for the future reproduction in nature, it is advised to rear the young partridges through the use of biological or substitute mothers (bantam hens). Regarding the use of true mothers, this technology demonstrates very low production efficiencies and can be used only for experimental purposes (M.A.F.F.R., 1990-95). The use of brooding bantam hen in breeding farms of small dimensions, on the contrary gives production comparable to those obtained with the use of the most modern technologies. As regards the use of brooding hens, even if it is possible to brood the eggs by the hens for all, (or part of the embryonic period), the dummy eggs below the bantam hens should be replaced by just artificially hatched birds, for hygienic-sanitary reasons and for the scheduling of the productions. If the eggs are brooded by the hens for all, or for part of the embryonic period, the nests must be prepared in structures such as baskets or boxes at a hight not more than 20-30 cm. It is necessary to arrange the inside of the nests with a layer of hull or of hay, never of straw. Straw or layers of hay less than 10 cm or greater than 30-40 cm cause quick cooling of the eggs with a consequent increase of no-hatched chicks, especially at the start of the production season, when the weather is still cool. Whatever technique is used, the hens must be always introduced to their new sitting boxes, closing the boxes behind them to prevent the escape of the hens. The sitting boxes must be located in darkened places (max.: 7-10 lux) with a photo period of 8 - 10 hours of light per day at least 10 days before the start of the brood (or hatch). Movable coops with shutters can be simply located below a roof. The broads should be removed from their nests once a day for about ten minutes, at the same time and always in the same order, to facilitat feed, drink and defecate. For the 7- 8 days following the start of the brooding induction, the birds must be brought again in the nests (the use of an ash stick, about .5m in length inserted into the ground near of the feeders and the drinkers, is extremely useful to tether the broodies when off the nest). Once the hens have changed their hormonal balance from an egg laying status to a brooding status, (at least 10- 15 days from the beginning of the brooding induction) it is possible to replace the dummy eggs with the fertile ones or the just hatched chicks. In the case in which all the norms of natural brooding be respected, the eggs brooded by the hens show a better hatch, despite the greater sanitary risks and the difficulties to manage the hens during the period of the embryonic development (O.F.C., 1973). From the day after hatch, the families groups must be allowed access to movable runs or flying pens, where they can be reared up to the time of the sale. During the first week the young birds need mown ground pens than pens with grass and bushes, like the pheasants.

CONCLUSIONS

The breeding of partridges and pheasants must be varied in relationship to the purpose for which these gamebirds are reared. For the production of bird for slaughtering, the techniques of breeding currently used guarantee a very good quality of the meat. For the production of birds for game (hunting purpose) or release in the wild, the techniques of breeding currently used very often produce birds characterised by very low quality.

Since the breeding technology influences very strongly the future behaviour of the bird produced, it is necessary to breed the birds according to their natural behaviour and to avoid to the birds of being attached to the man.

As regards birds reared for the release in to the wild, only pheasants can be reared separately from biological or substituted parents, in view of the fact that pheasants are not a gregarious species provided that the chicks are not attached to man. Young pheasants must have access to big flying pens, not lower than 4m - 5m, till the age of 25 - 35 days. Pens must be provided with trees, to induce the birds to sleep aloft, with grassy and shrubby vegetation, and artificial structures, to force the animals to fly for their shifts and to prevent excessive going on foot. Every artificial systems used to reduce pecking must be banished and the density, as well as the consistence of the reared groups must be strongly reduced. Partridges can be reared similar to pheasants only if reared for hunting. Partridges reared to restore lost densities or for the increasing of the consistence of the natural populations, must be produced, with chicks, artificially or naturally hatched but always reared with natural or substitute mothers (bantam hens). The family groups which will constitute the "flights" (max. 15 - 20 partridges/each) must be reared in fixed or movable flying pens with grass and shrubs.

All artificially reared birds, even if all the rearing recommendations are followed, invariably show a lower reaction to raptors and a lower development of the gut than the wild born birds. To increase the middle term survival rates, a period of gradual adaptation to wildlife (to adapt to natural feeds and to learn the self defence) is however needed.

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