CHAPTER 6

ALTERNATIVE HOUSING SYSTEMS

6.1 In response to criticisms of intensive poultry production by animal welfare groups and others a number of alternative systems have been proposed. These systems generally provide a greater space allowance within which the fowls may move, and some provide access to litter and perches.

6.2 This chapter reviews the various alternative egg production systems operating in Australia and overseas countries. It also looks at recent developments in Europe where, in some countries, conventional cages are being phased out and alternative egg production systems have been introduced. The chapter also looks at the economic viability of alternative systems and finally considers the issue of consumer demand for non-cage eggs.

6.3 The Committee, during the course of the inquiry inspected a range of different housing systems, including aviary, deep litter and free-range systems in addition to various types of cage systems, in several States. The information gained during these visits, and especially the opportunity to discuss features of these alternative sytems with producers, assisted the Committee in gaining some appreciation of both the advantages and disadvantages of the respective systems. The Committee also received a large volume of evidence in submissions and at public hearings from both proponents and opponents of the alternative egg production systems. In addition, the Committee reviewed various Australian and overseas studies that have examined these systems.

6.4 In Australia, as discussed in Chapter 5, the cage system accounts for over 90 per cent of layer production. There are, in addition, free-range farms in all States, as well as some relatively small, barn, deep litter and semi-intensive systems. However, the collective flock size from these alternative systems represents only a small proportion of the total commercial laying industry in Australia.[1]

An Analysis of Alternative Systems

6.5 A range of alternative systems to the conventional cage systems have been proposed over the years. Some of these systems have been introduced on an experimental basis, such as get-away cages, while others have been introduced commercially, such as deep litter and aviary systems.

6.6 The main alternatives include:

- other cage systems such as get-away cages;
- other intensive systems such as deep litter, and aviary or perchery systems;
- semi-intensive systems which combine a house and small yard or straw yard; and
- extensive or free-range systems.

These alternative systems are discussed and evaluated below.

Get-Away Cages

6.7 Get-away cages are enlarged versions of a conventional cage, housing 15-30 birds each, with one or more vertical levels of perches inside the cage which allow the birds to get away from each other. Attached to the outside of the cages are boxes for nesting, dust bathing and ground scratching.

6.8 The concept of the get-away cage was first developed at the Experimental Husbandry Farm at Gleadthorpe, England, in the mid 1970s. Although this type of cage system has been introduced experimentally in a number of overseas countries it has not been tested in Australia.

6.9 These cage systems are designed as a means of maintaining the economy of production and high egg quality associated with conventional cages while at the same time providing birds with nest boxes, dust bathing boxes, perches and enough space to move around and get away from other birds. The major research into get-away cages has been conducted at Celle Poultry Research Centre, West Germany. Current experiments, which were first commenced in 1979, have yet to prove this system as being a suitable alternative for laying hens. Dr Murphy, a poultry researcher, noted that the following problems had been highlighted at Celle in relation to get-away cages:

- Inspection and access to the birds is difficult. The nest and dust boxes and feed troughs obscure vision into the cages, which also makes behavioural observation of the birds difficult.

- Birds do not restrict their laying to the nest boxes but nest and dust-bathe in them. This results in up to one-third of eggs being dirty plus an unknown number of destroyed or eaten eggs. Costly nest litter has to be replaced frequently and the hens also destroy 'permanent' nest mats.

- Birds not only dust-bathe in the sand box but lay there and those eggs also become soiled or broken. Also sand is spread around the cage by the birds, damaging the movable parts such as manure belts.

- Perching birds soil birds below and birds may abrade their back on overhead perches.[2]

6.10 Experiments are however being conducted at Celle with design modifications to try to overcome some of the problems discussed above while maintaining an economically efficient system.

6.11 The Committee also discussed the concept of get-away cages with Professor Tauson of the Swedish University of Agricultural Sciences. He indicated that the experiments he has conducted with these types of cages have been mixed - while the birds have an enriched environment compared with the conventional cage, he reported there was higher feed consumption and some deterioration in foot condition and plumage condition.[3]

6.12 However, get-away cages do allow birds greater space. Observations on birds in get-away cages at Celle found that birds preen more in get-away cages than in conventional cages, although this may be because conventional cages are so small that they inhibit preening or because the get-away birds have dirty plumage.[4] From the operators' perspective the get-away cages have the same advantage as conventional cages in that there is no direct physical contact with the birds. While the get-away cages are still cages, in the sense that they have bars, and therefore still convey confinement and restriction of freedom, they do not restrict the performance of certain types of activities, as happens in conventional cages.

6.13 Another construction similar to the get-away cage is the Ventilated Litter Shelf System (VLSS). The system consists of cages with groups of 15-25 birds per cage at 720-1200 cm^2 floor space per hen. The cages also include nests and perches. The main difference compared to the get-away cage is that the cage floor itself is covered with litter. It may also be ventilated by air pressure from under the cage and up through the top of the cage in order to keep up the condition of the litter and to be able to filtrate the dust from the air in the poultry house. For this purpose the sides of this system are made of plexiglass.

6.14 The results so far obtained with the VLSS-system are encouraging with a low frequency of floor laid eggs reported and relatively easy inspection of birds.[5]

Deep Litter

6.15 In deep litter systems, birds are housed in sheds on an earthen floor covered with wood shavings, sawdust or some similar material to absorb moisture and droppings. For laying hens, nests are provided. Groups of birds may be confined in pens within the shed or given access to the full shed area.

6.16 Several contributors to the inquiry, including Dr Wirth of RSPCA (Australia), favoured this system over the cage system. Mr Bell of the AVA also suggested that if the cage system was phased out, the deep litter system would be his preferred option.[6] The Committee questioned Mr Bell as to the likely effect on the health of the birds of this system and whether under a deep litter more chemicals would have to be used on the birds to control worms, lice, coccidiosis and other diseases that they may pick up off the ground. However, Mr Bell saw few potential health problems, He argued that:

> ... [it] would depend on how well managed the deep litter system was. If a high standard of quarantine and hygiene was maintained, if the litter was cleaned out between every batch, a lot of those potential problems could be controlled by management. There would not necessarily be an increased use of drugs, particularly during the laying period. With coccidiosis, for example, certainly birds, young chickens on litter, need to receive a coccidiostat continuously to prevent major outbreak of coccidiosis. But generally, by the time they have approached adulthood they become immune and those drugs can be withdrawn. So, considering the laying cycle, it is not necessary to feed drugs continuously.[7]

6.17 Mr Bell, however, emphasised some [redacted]he disadvantages of the system. He noted that:

> ... the main disadvantages of moving egg producing birds into deep litter systems have come back to economics again. The birds are more active so they consume more feed and there would be higher labour costs in collecting the eggs and. generally, looking after the birds.[8]

6.18 Some other disadvantages associated with deep litter systems have been identified. For instance, a large number of eggs are laid on the floor and many become extremely soiled. In addition, unrestricted access in deep litter sheds can lead to suffocation and injury to birds. Domestic fowls frequently panic and take fright at an unfamiliar noise or smell and flock to one end or corner of the shed. Food consumption also tends to be greater than in cage systems. Deep litter birds may also be exposed to many of the problems encountered in 'free range' systems such as disease (via access to droppings in the litter), parasites, difficulty of inspection and supervision. Feather pecking and cannibalism may also be a problem. This system also requires greater capital investments per bird than cage system because of the housing space requirements.[9]

6.19 While acknowledging these disadvantages such systems also provide a number of welfare advantages. For instance, there is freedom to move within the house area and an opportunity to stretch wings to the full extent and to exercise in a variety of different ways. There is also the opportunity to use nest boxes and achieve privacy when laying. There is also no exposure to predators in this system.

Aviary or Perchery Systems

6.20 An aviary or perchery system is a plastic site house with perches, feed and water on several vertical levels. Dr Murphy reported on two centres studying aviaries - the Experimental Husbandry Farm at Gleadthorpe, England and the Federal Small Animal Research Institute at Celle in West Germany.

Both aviaries provided a litter section at floor level and a vertical arrangement of wiremesh floor and/or wooden perches or platforms. Preliminary trials of the system commenced in 1979. Dr Murphy reported that initial results of these experiments which indicated the following disadvantages of both systems:

- there was extensive floor laying by birds with the resultant loss of eggs through the slats;

- the hens used nest litter as a medium for scratching and dust bathing, thus soiling the nests, resulting in over a third of the eggs being dirty and requiring frequent replenishment of nest litter;

- feed consumption was consistently higher in the aviary than in cages. This may be due to increased food wastage or changes in energy requirements due to postural differences and an increase in activity;

- there were unacceptably high levels of ammonia in the aviary;

- clean out between flocks was difficult as the slats and most of the equipment had to be removed from the buildings for effective cleaning;

- inspection and access to birds was difficult (movement around the aviary by people was difficult as many sections had restricted head room);

- birds in the aviary had fewer head feathers and a greater incidence of comb damage suggesting higher levels of aggression than occurring in cages; and

- feather pecking and cannibalism have been a major problem in both aviaries and both have reported severe feather loss amongst the birds.[10]

6.21 Dr Murphy also observed the behaviour of the birds in the Celle aviary. Her observations suggested some aspects of the birds' welfare was improved (e.g. with the provision of nest boxes, litter for scratching, dust bathing and space for running and wing flapping) but in some respects it was reduced. A very high level of agonistic behaviour was observed - although the birds had no physical restraints on movements these were social restraints e.g. birds 'guarded' the ladders between the two slat levels, challenging all birds attempting to ascend or descend. While it appeared that the birds had complete freedom to perform any behaviour this was not necessarily the case.[11] Ewbank also reported that bone damage may be significantly higher in these systems.[12]

6.22 Commercial aviary systems have been introduced in Switzerland and the Netherlands and this system is the preferred production system by large producers in these countries. Studies of these systems have reported that there are several advantages of these systems including easy and effective inspection of birds and the possible mechanisation of daily routines such as feeding, watering, egg collection and removal of droppings.[13] A study by Folsch on aviary systems operating in Switzerland reported that fowls in such systems displayed a tight plumage, which among other things conserved energy, thus preventing an excessive feed intake and beak and claw-cutting was found to be unnecessary as the litter-covered floor surface contained abrasive material such as sand which kept claws and beaks blunt and short.[14]

6.23 These observations suggest that many of the problems noted in the experimental studies may be overcome, at least to some extent, where the system has been introduced on a commercial basis. However, in discussions with Professor Tauson the Committee was told that in the Netherlands, the tiered wire-floor aviary system has not been totally successful.[15]

Covered Straw Yard

6.24 The straw yard system is a covered shed, uninsulated and naturally ventilated, giving protection from the weather. The floor is deeply strawed and is kept topped up throughout the laying period. Inside the house there are nest boxes for laying, hanging feeders and drinkers and movable perch units for roosting.

6.25 Both advantages and disadvantages have been reported for this system from studies conducted in the United Kingdom. The system compares favourably in capital costs with cage systems. Production has been found to be much the same as for birds kept in cages and food consumption is also similar. The similar levels of food consumption may be due to the birds deriving extra food from the straw and the fact that caged birds consume food and water more from boredom than actual need. The birds have a varied physical environment and are able to scratch in the straw. The birds appear to develop a good covering of feathers which seem to act as effective insulation for the cold weather. Running costs are not excessive since there are no fans or mechanical equipment - with only artificial lighting as essential.

6.26 The disadvantages of the system is that it requires more skill and care to operate than a cage system, and it cannot be easily automated. In addition, some eggs may become dirty, depending on the state of the litter. While such a system fits well into a mixed farm environment it is unlikely that the system would be suitable for large-scale production.[16]

Free-Range Systems

6.27 This system, referred to as 'free-range', 'open-range' or the 'flock' system, involves running birds in an open paddock where they are free to roam at will. Usually, shelter is provided by a central shed or a number of small sheds spread over the area.

6.28 As indicated previously in the chapter, there are free-range farms in all States. In New South Wales there are four producers which have between 1,000 and 6,000 hens per farm on range. Victoria has eight producers each with between 1,000 and 8,000 hens on range. In Western Australia there are five range producers each with 1,000 to 6,000 hens, some of which have a more conventional semi-intensive element to their operations. Tasmania has one producer with more than 1,000 hens on range. In Queensland and South Australia there are no range producers with more than 1,000 hens.[17]

6.29 The Committee visited a number of free-range farms during the course of the inquiry. In general, the Committee found that the physical condition of the birds was not as good as in the cage systems visited. The Committee saw evidence of feather pecking and cannibalism. In addition, the hens were observed drinking from stagnant and polluted pools of water and the areas where the birds were located were often not adequately grassed. There also appeared to be only minimal use made by the birds of the range area, with most birds using the sheds. The Committee was also concerned at the risk of disease under these conditions and the prospect of dirty or contaminated eggs. There also appeared to be a major problem with the inspection of the birds.

6.30 Many of these concerns were raised in evidence presented to the Committee by witnesses such as the ACEP, AVA, and the NSW Department of Agriculture and Fisheries. The AVA and Dr Kite, of the NSW Farmers Association claimed that the risk of disease and internal parasites was high under free-range systems because parasites and disease organisms are carried in the soil, litter and droppings.[18] The Committee also raised the possible problem of salmonella contamination of eggs in free-range systems. Dr Kite claimed that:

> In free-range situations, if they [the eggs] are laid in nests, if there is manure in nests or even if they are just laid on the ground, there is a fair risk that those eggs could pick up all sorts of contaminants, and salmonella is one that could certainly be

> picked up in that way. Yes, there is a much greater risk of salmonella getting into eggs under free-range conditions than there is under cage conditions.[19]

6.31 As to the question of chemical contamination of eggs in general, Mr Holland of ACEP stated that:

> The fact that the birds are running on the ground, and very often in backyard situations under fruit trees and this sort of thing, where the trees have been treated with chemicals, and the birds tend to absorb these chemicals. An examination of all the reported chemical contamination of eggs would show that the largest percentage of these come from free-range operations.[20]

6.32 The AVA also claimed that former agricultural land may be contaminated with pesticides and other chemicals, to the detriment of both the birds and the people consuming their eggs.[21]

6.33 Inspection of birds is often difficult under free range conditions because they are spread over such a wide area (usually 240-370 birds per hectare). Therefore, birds suffering from disease or injury may remain unnoticed and left to suffer or die.

6.34 In addition, the well-established 'peck order' of domestic fowls is uncontrolled under 'open range' conditions. Cannibalism and feather pecking among domestic fowls can occur under these conditions where the birds are not strictly controlled. Dr Kite told the Committee that in a free-range situation the birds' social hierarchy, which is based on recognising a small number of flock mates, is disrupted. She added:

> When they have a lot of other mates to recognise you run into trouble, because obviously they cannot recognise a thousand others. That is where agonistic or aggressive behaviour tends to come about. That is why you see more aggressive behaviour at free range, because each of those birds has potentially a much larger group of companions that it is regularly coming into contact with.[22]

6.35 In addition, there is no control over environmental conditions on the range. Access to water, and the quality of that water, may be a problem; and extremes of temperature can have serious effects. The Committee questioned Mr Holland about comparisons of losses in heatwave conditions between caged and free-range birds. He argued that:

> I imagine they would be much the same. The free-range sheds tend not to have the sophisticated cooling equipment but the birds have natural methods of cooling themselves in a free-range situation - they get into the soil and transfer heat in that direction and they tend to move to cooler areas. I would not think there would be a great deal of difference.[23]

6.36 Mortality may also be higher than under other systems in part due to predation; in the cage system this problem is eliminated. In a cage system, Mr Holland estimated that the mortality rate was about one per cent per month, with some farms averaging half of one per cent.[24] Dr Kite argued that mortality is typically much higher in free-range systems, predominantly due to increased cannibalism.[25]

6.37 A further disadvantage of the 'free-range' system is that eggs are laid in various parts of the paddock and often in unhygienic conditions. Failure to find eggs on the day of laying - a common occurrence under these systems - can result in eggs that are unfresh reaching the market.

6.38 Feed consumption, labour requirements and management demands are also considerably higher under this system leading to greater production costs. Generous land requirements are also needed. The Committee estimated that if the current population of laying hens in Australia were put out at range, at a stocking density of 10 square metres per bird, as recommended by ANZFAS, it would require a land area of some 13,500 hectares or 135 million square metres.[26]

6.39 Annual egg production is likely to be lower in free range systems than for other systems. Egg production costs are also higher than under alternative systems. A study by Carnell estimated that in the United Kingdom egg production costs for free range eggs were 52 per cent greater than for caged eggs.[27]

6.40 Despite the disadvantages and problems associated with free-range production, proponents including Professor Singer and others, claim that the system provides considerable welfare benefits. They claim that the birds are free to move within the range area and within the shed or sheds provided. A varied physical environment is provided with ample opportunity to exercise and dust bathe. The environment provides an opportunity to feed on vegetation and to augment and vary diet in other ways during the warmer months of the year. There is also the opportunity to use nest boxes and therefore to get away from other birds when laying and achieve privacy.[28]

6.41 While it is possible to extract a premium from the market to cover the extra production costs, market research indicates that less than five per cent of consumers are willing to pay this premium.[29] Evidence to the Committee also indicated that a certain proportion of eggs sold as free-range are in fact from cage systems.[30]

6.42 Mr McMaster of the ACEP also suggested that the premium would be greater and their market share would decline, if free-range operators had to establish entirely new farms or if they had to make significant capital replacements to their existing facilities. He suggested that, at the present time, most of the producers who supply the market are only covering their marginal costs.[31]

6.43 It is often claimed that eggs produced under open range conditions have a higher nutritional value than eggs produced under intensive conditions. However research in the United Kingdom and Australia, comparing eggs from different production techniques and at different times of the year has found that

there is no significant nutritional difference between the various systems.[32] Evidence presented to the Committee indicated that free-range eggs probably contain slightly more chemical contamination because of the way they are produced.[33]

6.44 Another claim often made in relation to eggs produced in open-range systems is that they are fresher than eggs from cage systems. However, in many instances, the opposite may be the case as so called 'farm fresh', free-range eggs are produced under largely unsupervised conditions. Whereas 'open range' produced eggs may not be collected for some time after laying, intensively produced eggs are collected immediately, packed, refrigerated and sent to market on the same day.

6.45 In summary, it appears that there are numerous welfare disadvantages associated with free-range egg production in Australia. On the basis of the evidence received and its observations of free-range operations, the Committee believes that such systems have a higher incidence of disease, a significant problem of predation; the possibility of chemical contamination of eggs; and a high rate of feather pecking and cannibalism, when compared with other systems of egg production. Evidence also indicates that such systems require large land areas on which to operate and a high level of stockmanship skills. Labour inputs and overall production costs are also considerably greater than for alternative systems.

Recent Developments in Europe

6.46 Several countries in Europe have either begun phasing-out battery cages and/or introducing alternative egg production systems on a commercial basis.

6.47 In 1981 Switzerland began a 10 year program for the phasing out of the battery cage system. The 1981 Swiss regulations prohibits the installation of new battery cage systems and existing systems must be converted to alternative

systems by the end of 1991. In addition, by the end of 1991 all laying hens are required by law to have direct access to protected, darkened, soft-floored or litter-lined nesting boxes. There has been noticeable progress towards the introduction of alternative systems under these regulations. ANZFAS provided figures that indicated that at the beginning of 1990, some 70-75 per cent of Swiss eggs were produced from hens housed under alternative systems. Data in a study by Amgarten and Mettler confirmed these figures - the study estimated that 35 per cent of eggs on the Swiss market were produced from battery systems, 50 per cent from new housing systems and 15 per cent from free-range farms.[34]

6.48 To date, five alternative systems have been approved by the Swiss Federal Veterinary Office. Smaller producers have generally introduced deep litter systems whereas larger producers have generally preferred the aviary system. The number of semi-intensive and free range establishments is also increasing due to the considerable consumer demand for non-battery eggs.[35]

6.49 However, it also needs to be noted that Swiss egg production provides only 50 per cent of total consumption - with the remainder imported from cage systems in Germany and elsewhere in Europe.[36] The Swiss egg market is also relatively small and production has traditionally been concentrated in small farming units, making the transfer to alternative systems less difficult. Professor Tauson also told the Committee that some 30 per cent of birds are still in cage systems, albeit in cages that offer considerably more space per hen than in other countries. The Swiss cages are required to provide laying hens with 800 cm^2 of space per bird and also are required to provide perches and nest boxes.[37]

6.50 In Sweden, a new Animal Protection Act came into force which in 1988 providing for the phasing-out of battery cages over the next ten years. Since 1 July 1988 the construction of new battery cages has not been permitted.

6.51 ANZFAS, in evidence to the committee claimed that the Swedish Government had indicated that the free-range system will be considered as an alternative to the current battery cage system.[38] In discussions with the Committee, Professor Tauson said that Sweden had not as yet decided on an alternative system. He indicated that the alternative systems tested to date had not been able to meet a number of criteria laid down by the Government - that is, that any new system not impair the hens' health, lead to increased medication, involve beak trimming (which is banned in Sweden), nor impair the working environment.[39] Professor Tauson also told the Committee that he believed a free-range system would not be a realistic option in Sweden because of the climatic conditions.

6.52 The Dutch Government is also committed to the phasing-out of the battery cage system of egg production by July 1994. ANZFAS claimed that the Government has set down specific regulations for the housing of laying hens to apply by that date. For instance, a floor surface of at least 1,000 cm^2 must be provided for laying hens and at least one third of the floor surface must be provided with litter.[40] Regulations have also been established for aviary and tiered wire floor systems. However, Professor Tauson claimed that these regulations have not yet been agreed to.[41]

6.53 At present 15 per cent of Dutch eggs are produced in deep litter systems. Since the 1970s consumer preference for non-battery eggs has been growing and has led to the development of alternative systems. A survey conducted in the Netherlands in April 1986 revealed that 86 per cent of respondents indicated a willingness to pay more for 'animal freely' products such as deep litter eggs.[42]

6.54 The demand for deep litter eggs comes not only from the domestic market but from neighbouring West Germany as well which has imported over 40 million deep litter eggs (over 15 per cent of production) annually from the Netherlands over the past few

years. In the past, production has been mainly on deep litter farms with fewer than 10,000 hens, however, the number of larger farms is increasing and farms of 40,000 hens are not unusual.[43]

6.55 In Denmark, although legislation has not been passed to ban cages, battery cage egg production is declining and the number of new alternative farms in increasing. Strict Danish requirements for hen welfare, such as the establishment of maximum stocking densities of 7 birds per square metre and a minimum litter area of one-third of floor area, has provided an incentive for farmers to convert to deep litter production and other alternative systems. Since the 1970s egg production using deep litter systems has increased significantly. It is estimated that at the present rate of conversion for battery cage to deep litter production, by the end of the 1990s non-cage production will account for 80 per cent of Danish egg production.[44]

The Economics of Alternative Systems

6.56 Several studies have been undertaken in overseas countries and Australia which have attempted to assess the economic viability of alternative systems, by calculating the differences in production costs between various production systems.

6.57 A study by Elson in 1986 compared the production costs for different egg production systems in the United Kingdom. Table 6.1 shows the results of that study.

Table 6.1: Egg Production Costs in Different Housing Systems

System	Space[a]	Cost[b]
Laying cage	450 cm^2/bird	100
Laying cage	560 cm^2/bird	105
Laying cage	750 cm^2/bird	115
Laying cage	450 cm^2/bird + perch	100
Laying cage	450 cm^2/bird + perch + nest	102
Shallow laying cage	450 cm^2/bird	102
Get-away cage, 2-tier aviary	10-12 birds/m^2	115
Aviary and perchery and multi-tier housing	20 birds/m^2	105-108
Deep litter	7-10 birds/m^2	118
Straw yard	3 birds/m^2	130
Semi-intensive	1000 birds/ha	135 (140)[c]
Free range	400 birds/ha	150 (170)[c]

[a] Space refers in cages to cage floor area, in houses to house floor area and in extensive systems to land area.
[b] Taking battery cages as the 100% base cost.
[c] Includes land rental.

Source: H.A. Elson, 'The Economics of Poultry Welfare', in Report on Second Symposium on Poultry Welfare, World Poultry Science Association, Celle, 1986.

6.58 The table shows that production costs for eggs produced in battery cages under various stocking densities increased from between 2 and 15 per cent over the cost of eggs produced in battery cages at a stocking density of 450 cm^2 per bird. There were cost increases of between 5 to 18 per cent for eggs produced in aviary or deep litter systems; increases of between 35 to 40 per cent for eggs produced in semi-intensive systems, and increases of 50 to 70 per cent in free-range systems.

6.59 A Dutch study published in 1989 by the Institute of Agricultural Engineering estimated that production costs for eggs produced under aviary systems were 4.6 per cent higher than eggs produced under cage systems. For deep litter systems the comparable figure was 15.7 per cent higher.[45]

6.60 A study by Amgarten and Mettler compared the production costs of three groups of alternative systems in Switzerland. The study found that production costs were between 4 and 9 per cent higher than that of the battery cage system.[46] The higher egg production costs in the new housing systems were largely due to higher equipment and construction costs and increased labour costs. Feed costs per egg were found to be similar to those of battery cages.[47] Evidence also indicates that despite the availability of cheaper foreign eggs, Swiss eggs are still largely preferred by Swiss consumers.[48]

6.61 In 1980 the UK Ministry of Agriculture, Fisheries and Food (MAFF) made a cost comparison of different commercial egg production systems. The egg production costs were estimated as follows:

Cages	40.5p per dozen
Deep Litter	47.4p per dozen (+ 17%)
Straw Yards	47.4p per dozen (+ 17%)
Free-Range	72.5p per dozen (+ 79%).[49]

6.62 The additional costs of egg production under systems other than battery cages were:

Deep Litter	6.9p per dozen
Straw Yards	6.9p per dozen
Free-Range	32.0p per dozen.[50]

6.63 The data show that egg production costs from deep litter and straw yard systems were 17 per cent greater than for battery produced eggs. Free-range egg production costs were some 79 per cent greater than battery produced eggs. The cost increases for free-range eggs were mainly due to higher labour costs, lower egg production, and additional land rental costs and fixed capital investment costs associated with these systems.

6.64 Another comparative study of systems in the United Kingdom was conducted by Carnell.[51] The different egg production costs are shown below:

Table 6.2: A Comparison of Egg Production Costs

	Cost	Percentage increase (a)
Battery cages (5 birds/cage)	44p	-
Deep-litter (1.5 ft^2/bird)	48p	9
Aviary	49p	11
Straw yard	54p	23
Semi-intensive	58p	32
Free-range	67p	52

(a) Percentage increase over battery egg production.

SOURCE: P. Carnell, 'An Economic Appraisal of Less Intensive Systems', in Universities Federation for Animal Welfare, Alternatives to Intensive Husbandry Systems, UFAW, Potters Bar, 1981, p. 24.

6.65 This study also found that egg production costs were substantially greater for extensive systems. For example, free-range production costs were found to be some 52 per cent greater than eggs produced under the battery system. However, the figures were significantly lower than the MAFF estimates.

6.66 Prior to the mid-1980s there had been little systematic attempt to assess the economic implications of alternative systems in Australia. In 1987, Macindoe estimated the production costs in Australia of the caged system compared with three alternative systems, based on costs in Australia in 1985-86.[52] The alternative systems were the tiered wire-floor (TWF) aviary, litter/slats and free-range systems.

Table 6.3: Estimated Cost of Egg Production in Australia from Caged Layers and Alternative Systems

	Cages	TWF Aviary(a)	Litter/ Slats	Free-Range
		(cents/doz)		
Depreciation & fixed costs (ex. labour)	20	22	22	30
Feed	40	40	40	45
Flock replacement	20	22	22	22
Marketing	15	15	15	15
Labour	10	12	14	30
Other costs	5	5	5	5
TOTAL	110	116	118	147

(a) TWF: tiered wire-floor aviary system

SOURCE: R.N. Macindoe, 'Alternative Systems for Housing Layers', in P. Henry et. al. (eds.), Intensive Animal Welfare, Australian Veterinary Association, Brisbane, 1987, p. 133.

6.67 The data in Table 6.3 indicate that egg production costs under free-range conditions were some 34 per cent greater than eggs produced under cage systems. Production costs under aviary and litter/slats systems were six and seven per cent greater respectively, when compared with cage systems.

6.68 The study showed that the major operating costs associated with commercial cage egg production were, in order of importance, the cost of feed , flock replacement, marketing amd labour. All operating (or variable costs) were directly related to the level of egg production.

6.69 For free-range systems, labour costs were shown to be significantly higher than for alternative systems as fewer birds could be maintained per unit of labour under such a system. Depreciation and fixed costs were also shown to be significantly greater under free-range systems. Feed costs were shown to be higher and flock replacement costs were also greater, due to higher mortality rates under free-range conditions.[53]

Consumer Preference

6.70 Some evidence received by the Committee indicated that there was an increasing demand in Australia for non-cage eggs, although the market for such eggs was still relatively small. A study conducted in 1984 for the Victorian Egg Board revealed that 76 per cent of people surveyed were prepared to pay a price premium of 50 cents per dozen for a free-range product, 47 per cent would pay 80 cents per dozen more and 32 per cent up to $1.00 more.[54]

6.71 The Victorian Egg Marketing Board estimated that free-range egg sales in Victoria increased by 278 per cent over a four year period. Other evidence provided to the Committee indicated that the demand for free-range eggs far exceeded demand.[55]

6.72 Overseas evidence also indicates a growing consumer demand for non-battery produced eggs. As indicated previously, some 65 to 75 per cent of eggs on the Swiss market are non-battery eggs and demand is increasing. However, in Australia, as reported earlier in this chapter, NSW Department of Agriculture and Fisheries indicated that at present free-range egg production only accounts for about five per cent of the market.[56]

6.73 The Committee recognises that the current cage system of egg production provides a plentiful and relatively cheap source of supply of a basic and important food product to consumers. While many consumers may be willing to support the ideal of non-cage production of eggs, fewer may be willing to pay the higher costs associated with the production of these eggs. The Committee believes that any significant shift towards non-cage egg production should be dictated primarily by market forces, having due regard for the animal welfare implications of any change. The Committee believes that if consumers are willing to pay more for eggs produced in non-cage systems the industry will respond to this changing market demand.

Conclusion

6.74 The Committee has examined a range of alternative housing systems available for layers. It believes that the welfare advantages of particular systems need to be balanced against potential welfare disadvantages. For instance, while semi-intensive and free-range systems may provide an opportunity for birds to move freely within the house or on the range and engage in a variety of activities to satisfy their behavioural needs, a high incidence of disease, high mortality rates, and other welfare problems are often encountered in these systems.

6.75 The Committee considers on the basis of its observations of free-range farms in particular and from the evidence received, that this type of housing system may have many negative welfare consequences. In addition to a high incidence of disease, feather pecking and cannibalism appear to be more pronounced. Environmental conditions are often difficult to control; feed consumption, labour requirements and management demands are considerably higher than for other systems; egg production is often lower and there is a risk of contaminated eggs reaching the market.

6.76 The Committee believes that a number of welfare concerns associated with the free-range system of egg production, and the significantly higher production costs of this system, will inhibit the introduction of large-scale free-range operations in Australia.

6.77 However, the Committee believes that certain other non-cage systems could be viable in Australia, at least in the longer term. The fact that several European countries are phasing-out the battery-cage system of production and introducing a range of other semi-intensive systems, indicates that such systems are potentially commercially viable. Such developments, although largely in their initial stages, offer the prospect of a change in egg production methods. The Committee believes that these overseas developments should be closely monitored in Australia.

6.78 The Committee, however, believes that any large-scale introduction of alternative systems in Australia needs to be proceeded with cautiously taking into account the animal welfare implications of any such change. As Ewbank has noted:

> It could be both a welfare and an economic disaster to force the present population of battery birds out into the relatively untried alternative systems. Free range and intermediate systems (percheries, aviaries, straw yards, deep litter, etc.) do give the birds considerably more freedom but they are more difficult to run than battery units: they demand a higher level of stockmanship, the outdoor systems seem to have a higher level of disease, and the eggs cost more to produce. There is a real need for further research and development work on the intermediate and free range systems, in the hope that the problems will be solved and that it will finally be possible to phase out battery cages.[57]

6.79 The Committee believes that when assessing the many types of alternative systems that have been suggested as being capable of replacing the present intensive systems, a primary concern should be whether the proposed systems provide a true welfare advantage for the birds in terms of their physiological and behavioural needs. In addition, the Committee believes it important that Australia avoid the situation that occurred in several European countries where new systems were not properly evaluated under local conditions prior to their introduction. Accordingly, the Committee **recommends** that the banning of laying cages be considered when it can be demonstrated that viable alternative systems can be developed suitable to Australian conditions and that these alternative systems have positive welfare advantages. The Committee further **recommends** that a combination of cage and non-cage production systems be continued with market forces dictating the relative market share of the different systems.

6.80 The Committee notes that while significant research has been conducted into alternative systems in many overseas countries, comparatively little research has been undertaken in Australia. As there are several different genetic strains of bird

in Australia compared with European strains, and these strains will, on the basis of overseas experience, respond differently to various husbandry systems, the Committee believes it to be essential that more research be initiated in Australia.

6.81 The Committee believes that any research in Australia should also examine both the welfare aspects and economic viability of alternative systems to ensure the long-term success of such systems. The Committee also believes that the industry itself, State governments and other interest groups should be consulted throughout the research process. It notes that in some overseas countries a wide consultative process did not occur. In addition, overseas experience has shown that in some intances those conducting the research had little practical experience of large-scale husbandry systems. A broad consultation with qualified people may have predicted in advance many of the problems encountered. The Committee therefore recommends that the Commonwealth Government fund a research project in Australia to examine and evaluate alternative housing systems that may be suitable to Australian conditions and that this review:

(a) examine overseas research findings into alternative housing systems;

(b) assess the welfare benefits and any welfare disadvantages of such systems;

(c) evaluate the economic viability of alternative systems; and

(d) consult with poultry producers, State Governments, the veterinary profession, and specialist ethologists, both in the initial and subsequent stages of the project.

ENDNOTES

1. Letter to the Committee from the Australian Council of Egg Producers (ACEP), dated 28 May 1990.

2. Evidence, Dr L. Murphy, pp. S9002-4.

3. Committee discussion with Professor Tauson, 14 May 1990.

4. Evidence, Dr. L. Murphy, p. S9004.

5. R. Tauson, 'Cages for Laying Hens: Yesterday and Today-Tomorrow?', in J.M. Faure and A.D. Mills (eds.), The Proceedings of the Third European Symposium on Poultry Welfare, World Poultry Science Association, Tours, 1989, p. 174.

6. Evidence, Dr Wirth, Royal Society for the Prevention of Cruelty to Animals (Australia), p. 9596 and Mr Bell, Australian Veterinary Association, p. 9366.

7. Evidence, Mr Bell, Australian Veterinary Association, p. 9366.

8. ibid., p. 9366.

9. Livestock and Grain Producers' Association of NSW, Animal Welfare in Agriculture, n.d., pp.35-6.

10. Evidence, Dr L. Murphy, pp. 8956-57, pp. S9009-9010.

11. ibid., pp. S9011-9012.

12. Personal communication with Dr R. Ewbank.

13. ANZFAS supplementary submission, p. 5.

14. D. Folsch et.al, 'Research on Alternatives to the Battery System for Laying hens', Applied Animal Behaviour Science, 20 (1988), pp. 34-36.

15. Committee discussion with Professor Tauson, 14 May 1990.

16. D. Sainsbury, 'The Covered Straw Yard', in Universities Federation for Animal Welfare, Alternatives to Intensive Husbandry Systems, UFAW, Potters Bar, 1981, pp.37-8.

17. Letter to the Committee from the Australian Council of Egg Producers, dated 28 May 1990.

18. Evidence, Dr. Kite, NSW Farmers Association, p. 8702; and Australian Veterinary Association, pp. S8769-70.

19. ibid., p. 8702.

20. Evidence, Mr Holland, Australian Council of Egg Producers, p. 8701.

21. Evidence, Australian Veterinary Association, pp. S8770.

22. Evidence, Dr Kite, p. 8713.

23. Evidence, Mr Holland, p. 8711.

24. ibid., p. 8720.

25. Evidence, Dr Kite, p. 8714.

26. There are approximately 13.5 million laying hens in Australia. See evidence, Australian and New Zealand Federation of Animal Societies, pp. S8834-5. Calculations provided to the Committee by the Statistics Group, Parliamentary Library.

27. P. Carnell, 'An Economic Appraisal of Less-Intensive Systems in Egg Production and Breeding Pigs', in Universities Federation for Animal Welfare, op.cit, pp. 21-31.

28. Evidence, Professor Singer, pp. 9474-76.

29. Evidence, NSW Department of Agriculture and Fisheries, p. S8173.

30. Evidence, Mr Holland, Australian Council of Egg Producers, p. 8700.

31. Evidence, Mr McMaster, Australian Council of Egg Producers, p. 8702.

32. Livestock and Grain Producers Association, op.cit., p.41.

33. Evidence, Mr Holland, Australian Council of Egg Producers, p. 8701.

34. M. Amgarten and A. Mettler, 'Economic Consequences of the Introduction of Alternative Housing Systems for Laying Hens in Switzerland', in Faure and Mills, op. cit., p. 214.

35. Australian and New Zealand Federation of Animal Societies, supplementary submission, pp.6-7.

36. Amgarten and Mettler, op.cit., p.214.

37. Committee discussion with Professor Tauson, 14 May 1990.

38. Australian and New Zealand Federation of Animal Societies, supplementary submission, p. 7.

39. Committee discussion with Professor Tauson, 14 May 1990.

40. Australian and New Zealand Federation of Animal Societies, supplementary submission, p. 8.

41. Committee discussion with Professor Tauson, 14 May 1990.

42. Australian and New Zealand Federation of Animal Societies, supplementary submission, pp. 8-9.

43. ibid., pp. 8-9.

44. ibid., pp. 9-10.

45. ibid., p. 12.

46. Amgarten and Mettler, op cit., p. 227.

47. ibid., pp. 215-216.

48. Australian and New Zealand Federation of Animal Societies, supplementary submission, p. 7.

49. Ministry of Agriculture, Fisheries and Food, A Cost Comparison of Commercial Egg Production Systems, HMSO, London, 1980, p. 5.

50. ibid., pp. 5, 10.

51. Carnell, op.cit., pp. 21-31.

52. R.N. Macindoe, 'Alternative Systems for Housing Layers', in P. Henry et. al. (eds.), Intensive Animal Welfare, Australian Veterinary Association, Brisbane, 1987.

53. ibid., pp. 132-3.

54. Australian and New Zealand Federation of Animal Societies, supplementary submission, p. 10.

55. ibid., pp. 10-11.

56. Evidence, NSW Department of Agriculture and Fisheries, p. S8173.

57. R. Ewbank, 'Animal Welfare', in Universities Federation for Animal Welfare, Management and Welfare of Farm Animals, Bailliere Tindall, London, 1988, p. 11.