

FARM ANIMAL WELFARE COUNCIL  
REPORT ON  
THE WELFARE OF POULTRY AT THE TIME  
OF SLAUGHTER

Farm Animal Welfare Council  
Government Buildings  
Hook Rise South  
Tolworth  
Surbiton  
Surrey KT6 7NF

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To  
The Rt Hon Peter Walker MBE MP  
Minister of Agriculture, Fisheries and Food

The Rt Hon George Younger TD MP  
Secretary of State for Scotland

The Rt Hon Nicholas Edwards MP  
Secretary of State for Wales

When the Farm Animal Welfare Council was set up some two years ago, you agreed that its terms of reference should be extended to cover the welfare of animals at the place of slaughter. The Council was firmly of the view that it should be able to consider the welfare of farm animals at this stage and that a full-scale review of the subject should be one of our first jobs. There followed a decision by the Council in July 1980 to carry out such a review and we have now completed the first stage. This has dealt with the welfare of poultry at the time of slaughter and I have pleasure in submitting our report.

Various aspects of the slaughter of poultry give us cause for concern and you will see that we make a fair number of recommendations designed to bring about improvements. Several of the recommendations call for research or tests to be undertaken and I very much hope that the necessary work will be put in hand as quickly as possible and that it will lead to legislative or other changes being made.

We have now made a start on a similar review of the welfare at slaughter of cattle, sheep, pigs, goats, horses and rabbits and I look forward to submitting a further report to you in due course.

R J Harrison FRS  
Chairman

## FARM ANIMAL WELFARE COUNCIL

The Farm Animal Welfare Council was set up in July 1979 by the Minister of Agriculture, Fisheries and Food and the Secretaries of State for Scotland and Wales under the Chairmanship of Professor R J Harrison, MD DSc FRS, Professor of Anatomy at the University of Cambridge. It has been charged with responsibility for keeping under review the welfare of farm animals on agricultural land, at markets, in transit, and at the place of slaughter, and with advising the Ministers on any changes that may be necessary, either in the law or otherwise.

The Council has 22 members, including the Chairman, all of whom have been appointed by Ministers and serve in a personal capacity.

They are:

*Chairman:* Professor R J Harrison FRS MA MD DSc MRCS LRCP

*Members:* Mr C H Armstrong  
Mrs M A S Bates BSc (Agric)  
Rev A L Birbeck MA  
Mr P L Brown BSc MRCVS  
Mr S Burgess FBIM  
Mr J H Cullimore JP  
Professor J M Cunningham CBE BSc (Agric) PhD FRSE FIBiol  
Mr R Ewbank MVSc MRCVS FIBiol  
Mrs R Harrison  
Mr H F C Hebelers FRCVS  
Mr R J Hopkins  
Mr J A Inverarity  
Professor J O L King PhD MVSc BSc (Agric) FRCVS FIBiol  
Mrs H Knight  
Mr T M Leach MRCVS DVSM (Until 30 September 1981)  
Mr D G Llewellyn BVSc MRCVS  
Mr J McCaskie FIA(Scot)(Est)  
Mr M Nicholson MA Dip Ag(Cantab)  
Mr C Platt MIBiol  
Dr D W B Sainsbury MA PhD BSc MRCVS  
Mr I A Turner  
Professor A J F Webster MA Vet MB PhD MRCVS

# FARM ANIMAL WELFARE COUNCIL

## WELFARE OF POULTRY AT THE TIME OF SLAUGHTER

### *Introduction*

1. Since the Council was set up in July 1979, its attention has been directed mainly to subjects on which its advice has been sought by the Agriculture Ministers. However, an important feature of the Council's work is its freedom to initiate enquiries of its own into any aspect of animal welfare within its terms of reference. The first such enquiry to be carried out by the Council concerns the welfare of livestock at the time of slaughter and is being undertaken in two stages: the slaughter of poultry and the slaughter of red meat animals. The Council has now completed the first stage and this report on the welfare of poultry at the place of slaughter is submitted to the Agriculture Ministers in England, Scotland and Wales for their consideration.
2. Our enquiry includes the welfare aspects of religious methods of slaughter but we wish to examine this subject in relation to poultry and red meat animals together and it will be considered in our report on the second stage of the enquiry.
3. We have confined our review to the welfare of poultry from the time of arrival at the place of slaughter until death. Although the welfare of the birds during this period is closely linked to their treatment and handling during collection and loading at farms and during transport to the place of slaughter, these stages have been omitted from the scope of the review as we propose to look at collection and transport later on.
4. We have not included in our enquiry the slaughter of day-old chicks. We intend to examine this aspect of the slaughter of poultry at a later date.
5. Written or oral evidence, or both, was received from the organisations listed at Appendix A. Individual members of the public also expressed views in response to a press announcement issued by the Council inviting comments.
6. During the course of its review, members of the Council visited 17 poultry processing plants and saw the processing of broiler chickens, poussins, battery hens, turkeys, ducks and geese. Nine farms or other premises at which poultry, including guinea fowl, are killed were also visited. We wish to record our gratitude for the assistance received from managements and farmers and for the helpful discussions that took place at all the visits.

7. Concern for the treatment of birds at poultry processing plants has been expressed by organisations and individuals including the Farm Animal Welfare Co-ordinating Executive from whom we received a copy of their paper on Pre-slaughter Stunning Methods and Slaughterhouse Operation in British Abattoirs which had been submitted by the Executive in September 1979 to the Minister of Agriculture, Fisheries and Food. Almost 450 million birds are processed annually in these plants and the view is widely held that the nature of the slaughterhouse operations, their high degree of mechanisation and their speed and scale result in sentient creatures being treated with indifference. We have much sympathy with such views and, while our investigation has shown that the industry is conscious of its responsibility for the live birds in its charge and that deliberate ill-treatment at the place of slaughter is rare, we consider that some birds at slaughterhouses are caused suffering or distress, usually because of lack of knowledge, carelessness or unsympathetic treatment.

8. We believe that the amount of suffering and distress caused to poultry can be reduced if:-

- (i) poultry slaughterhouses, and the operations carried out in them, are planned with the welfare of the live birds in mind;
- (ii) all machinery and equipment function effectively;
- (iii) all machinery and equipment is frequently inspected, kept in good working order and always adjusted to the type of bird being handled;
- (iv) adequate training and supervision are provided for personnel working with live birds so that consideration for living creatures is maintained.

In addition, the welfare of the birds must be fully protected by appropriate legislation which must be properly enforced.

#### *Design of plant facilities and equipment*

9. We believe that from the time birds arrive at a processing plant until they are killed, their humane treatment is possible only if their welfare has been taken into account in the design of the plant, its facilities and equipment. For financial reasons, the industry needs to keep the number of accidental deaths and injuries as low as possible and, to this extent, commercial and welfare interests coincide. However, if standards of welfare are aimed only at minimising losses, they will not necessarily ensure the humane treatment of

all birds which pass through a plant since the conditions of handling to which they are subjected may still cause an unacceptable degree of pain or distress.

We recommend that in all plants the following requirements should be met:-

- (i) holding accommodation for birds awaiting slaughter should provide proper ventilation and proper protection from the weather;
- (ii) unloading arrangements should be such as to avoid unnecessary disturbance of birds;
- (iii) the system of moving loose crates containing birds from the lorry to the point at which the birds are removed from them should be such as to avoid any jolting or undue tilting of the crates;
- (iv) unloading and shackling arrangements should be designed to reduce to a minimum the physical effort required by the staff;
- (v) the positioning of the shackle line should ensure that the suspended birds are kept well clear of all obstructions, even when their wings are outstretched;
- (vi) the whole length of the shackle line up to the point of entry into the scald tank should be immediately accessible to staff so that birds can, if necessary, receive attention;
- (vii) there should be ready access to all processing equipment and its controls;
- (viii) working conditions for staff should provide adequate space and light and be hygienic, well ventilated, draught-free, dry (where possible) and dust-free;
- (ix) the speed of the shackle line should be limited to that which enables staff to perform their tasks efficiently, without undue haste and with proper regard for the welfare of the birds.

10. The Slaughter of Poultry Act 1967 and The Slaughter of Poultry (Humane Conditions) Regulations 1971 place upon local authorities certain responsibilities for the welfare of poultry at the time of slaughter and The Poultry Meat (Hygiene) Regulations 1976 give them responsibilities for the hygienic quality of poultry meat produced by plants handling well over 90%

of poultry slaughtered in Great Britain for human consumption. To discharge their responsibilities under this legislation, local authorities carry out inspections and, for plants required to comply with The Poultry Meat (Hygiene) Regulations 1976, they appoint Official Veterinary Surgeons and arrange for Poultry Meat Inspectors to be present. As a result of their involvement in slaughtering and processing poultry, valuable experience of the welfare requirements of the live birds is being acquired by local authorities and we believe that this could be beneficial to firms planning new plants or adaptations to existing ones. We recommend that firms and individuals planning to install new or modified facilities for the slaughter of poultry for human consumption should first seek advice from the appropriate local authority on the provisions to be made for the welfare of the live birds.

### *Crating*

11. No present system of crating poultry for transport to the place of slaughter is ideal for every type of collection point and processing plant. At the collection point the system used must take account of access, management system employed and size and type of bird. Similar considerations arise at the processing plant and are added to by further variables such as scale of operation. Loose crates, fixed crates or crate modules may be used but, whichever system is adopted, it is essential for the welfare of the birds to be fully protected during loading, unloading and in transit and during any period that they may remain in the crates while waiting to be slaughtered.

### *Loose crates*

12. Loose crates continue to be used extensively and are satisfactory provided that they are undamaged, that they have large enough openings through which the birds can be removed without injury, that they are stacked on the vehicle so as to allow sufficient ventilation (if necessary by leaving the top row of crates empty when the load is covered), that they are protected from the weather and are not jolted, thrown or unduly tilted when being handled. These requirements are not always met. Loose crates may be loaded on vehicles without leaving sufficient space for proper air circulation and, when being manually handled, may be carried at an angle and allowed to fall to the floor, perhaps because staff are careless or tired. Birds are also especially at risk when being removed from loose crates since they may be difficult to grasp and extract through an opening which may be relatively small compared to the size of bird being carried. There will be even more risk if the bird is struggling and able to flap its wings while it is being removed from the crate. During our visits, we saw many loose crates which were broken and some

from which the flaps, which should have covered the openings, were completely missing. The risk of injury when birds are carried in damaged crates or in crates which cannot be closed is considerably increased.

13. On the other hand, we were impressed by the method of transporting and handling loose crates using vehicles specially designed for this type of container and mechanical handling equipment for moving the crates from the vehicles to the point at which the birds were removed.

#### *Fixed crates*

14. Poultry are increasingly transported in purpose-built vehicles fitted with a fixed unit comprising a large number of individual crates. The use of fixed crates avoids some of the welfare risks which may arise with loose crates in that they are less susceptible to damage, the movement of individual crates loaded with birds is avoided, the design of the unit allows for ventilation, and access to each crate is obtained through the whole of one side which forms a hinged or sliding flap. The flaps, as well as the exposed sides of the crates at the rear of the vehicle, may be of solid construction with ventilation holes to provide protection from the weather.

15. While the fixed crate system can give better welfare protection than loose crates, careful attention is no less necessary to avoid injuries or unnecessary pain or distress. The fixed crates on these vehicles are more difficult to clean than individual loose crates and at some processing plants more attention needs to be given to the cleaning of this type of container. It is essential to ensure that crate flaps are securely closed when vehicles are loaded and the crates must be well maintained. We are aware of reports that poultry have been found in the road, having apparently fallen out of vehicles, and it seems more than likely that crate flaps may not have been properly closed. We noticed during our visits that flaps were sometimes left open.

16. The use of fixed crate vehicles also requires the installation of facilities which ensure that staff who unload the vehicles work from a position which gives them easy access to all the crates in each tier. A disadvantage of fixed crates is that they are necessarily deep from front to back. Unless unloading staff are positioned so that they have easy access to all the crates on each tier, the risk of injuring the birds when they are grasped to remove them from the crates will be increased.

17. The modular system is a development of the fixed crate system. Instead of the single complete unit fixed on a vehicle, the modular system consists of

a unit comprising a number of separate sections which can be independently unloaded from and loaded on to the vehicle. Each section contains several crates in tiers and the top of the lower crate lifts and forms the floor of the upper one. When poultry are being collected from the farm, the system allows the individual sections to be taken into the poultry house and the birds can be loaded into each crate from above. The system reduces the risk inherent in the fixed crate system of injury to the bird while being carried from the poultry house to the waiting vehicle. Top loading of the crates can also allow the birds to be handled with more care than when they are loaded through the sides of fixed crates. On the other hand, we have been told that when crates with lifting floors are used consignments frequently contain individual birds which have been trapped by an extremity or pinned by the floor above when it has been dropped into place. From time to time birds are found dead which have been pinned by the neck in this way. Loading from the top can cause leg injuries to the birds by being dropped, especially to those birds in the lower crates of a module. At the slaughterhouse, the crates are unloaded from the side in the same way as the fixed crate system and give rise to the same difficulties for the operatives.

#### *Crate modules*

18. A further development of the modular system gives additional advantages and allows poultry which are being removed from the crates at the processing plant to be picked up more easily. In this development, each crate is mounted on runners and forms a drawer which can be pulled out and access to the birds is gained through the open top of the drawer.

19. We believe that the standards of crating vary considerably and that loading and unloading are critical operations for the welfare of the birds. Whatever the system used, the performance of individual operators is crucial.

20. Under The Transit of Animals (General) Order 1973, no person is allowed to unload poultry from a vehicle in a way which is likely to cause injury or unnecessary suffering from whatever cause, including "by reason of ..... insecure fittings ..... in the receptacle, in which the [poultry] is ..... being carried". The Order also makes it "the duty of the consignor, carrier or other person for the time being in charge of [poultry] which is to be carried in a receptacle to ensure that the receptacle

(a) is soundly constructed in a manner which is not likely to cause injury to [poultry] carried therein, and is maintained in a good state of repair".

We believe that firms should ensure that their methods of transporting and handling poultry fully protect the welfare of the birds and we recommend that the Agriculture Departments should draw the attention of local authorities to the desirability of more stringent enforcement of the regulations contained in the 1973 Order.

*Waiting period at processing plants before slaughter*

21. Precautions are necessary to ensure that poultry awaiting slaughter at processing plants are kept in satisfactory conditions. When large numbers of birds are held together in a confined space, there can be a quick build-up of heat. Adequate ventilation is essential to avoid distress and casualties and, although it may be possible for loose crates to be spaced out to give better ventilation, this cannot be done when fixed crates are used. Exposure to adverse weather conditions must also be avoided. Safeguards against these risks are contained in The Slaughter of Poultry (Humane Conditions) Regulations 1971 which require poultry awaiting slaughter to be protected from the direct rays of the sun and from adverse weather and to be provided with adequate ventilation. At some processing plants, poultry awaiting slaughter are held in excellent conditions. At others, loaded vehicles are exposed to the prevailing weather by being parked in the open although forced ventilation may be available if required. We are aware that not all poultry awaiting slaughter receive the protection required by the 1971 Regulations and we recommend that the Agriculture Departments should draw the attention of local authorities to their responsibility for enforcing the provisions of The Slaughter of Poultry (Humane Conditions) Regulations 1971 requiring poultry awaiting slaughter to be protected from the direct rays of the sun and from adverse weather and to be provided with adequate ventilation. Indeed, we consider that the Regulations do not go far enough and we recommend that all processing plants should be required by law to have enclosed bays or other similar accommodation equipped with forced ventilation and a humidifying system.

22. The length of time between the delivery of birds to processing plants and their removal from the crates varies widely. The co-ordination of deliveries with production requirements may result in the waiting period not normally exceeding an hour or so and in some circumstances it can be less. However, several lorry loads are often kept waiting at any one time with the result that there is considerable delay in unloading. Moreover, because of production requirements, unloading may depend on the type of bird in the consignment

and not on the order of arrival of the lorries at the plant. Unloading delays tend to be more pronounced at hen processing plants where the birds can be collected from farms some hundreds of miles away at times to suit producers rather than at times arranged to minimise the period of waiting at the plant. It may not be unusual for such birds to be kept overnight for slaughter the next day.

23. We believe that the length of time that birds may be kept at a processing plant awaiting removal from their crates for slaughter should be restricted. This period of time cannot, however, be considered in isolation and must be related to the period during which the birds have already been in their crates since loading at the farm. The limit should, therefore be applied to the total length of time from loading into crates to removal from them at the processing plant.

24. The Directive of the European Community on the protection of animals during international transport (EEC 77/489) requires food and water to be made available where poultry are carried on journeys of 12 hours or longer, and we consider that the same should apply to poultry carried on journeys wholly within Great Britain. Since it is impracticable to feed and water poultry after they have been placed in crates for transport to a processing plant, it seems likely that the effect of such a requirement would be to limit to 12 hours the period between crating on the farm and unloading at the processing plant. We recommend that the period between loading the first bird of a consignment into a crate until the last one is unloaded at the processing plant should be limited by law to 12 hours.

25. The slaughter of birds can also be delayed by unforeseen circumstances such as a breakdown of the processing line. In such an event the welfare of any birds delivered to the plant or which are on their way there must be the prime consideration. Firms which operate more than one plant or processing line may be able to cope with such emergencies without too much difficulty but others may be faced with more of a problem. We consider it important for preparations to be made in advance for dealing with such situations and we recommend that all firms should have contingency plans to ensure that birds awaiting slaughter are not held in excess of the time limit recommended in paragraph 24 in the event of mechanical breakdown of a plant or other interruption of the processing line.

26. We understand that some processing plants are in contact by radio telephone with staff in the field in order to co-ordinate the delivery of birds to the plant with production requirements. Apart from the managerial

advantages of such a system, it is clearly beneficial to the welfare of the birds and, whenever practicable, we would like to see it used more widely.

### *Unloading and shackling*

27. We consider that the treatment of many birds when being removed from their crates and hung on the shackles is sometimes unnecessarily rough. The job, as well as being physically strenuous for the staff, is repetitive, dirty, dusty and noisy, and often has to be done at a speed to keep pace with a fast moving shackle line. In such conditions there is bound to be a risk of callous and careless handling and carelessness may also result in birds being suspended by only one leg or being placed on the line so that they bridge two shackles. Since birds which are injured or bruised are less profitable than sound ones, commercial considerations require managements to keep damage as low as possible but much of the evidence submitted to us contains comments on the risk to the birds at this stage and this was confirmed by our own observations. We consider that the speed of the line, or the number of staff employed in relation to the speed of the line, should allow for humane handling of the birds and that close and constant attention by senior staff is essential to ensure that proper care is taken at all times. We recommend that managements should ensure that the operation of removing poultry from crates and hanging on shackles is under the direct and constant control of supervisory staff.

28. The physical strain on the staff engaged in hanging birds on the shackle line and, consequently, the effect on their handling of the birds, is to some extent governed by the ease with which birds in the crates can be reached and placed on the shackles. We noted with satisfaction that the modular system described in paragraph 18 (where the crates are mounted on runners and form drawers which can be pulled out) substantially reduced the strain on staff. By unloading from an open drawer the staff were able to stand in a position which required them to turn through only 90 degrees to hang the birds on the line instead of turning right round through 180 degrees as is usually the case when unloading fixed crate vehicles. We recommend that all managements should ensure that their system of transferring birds from crates to shackles provides the best possible working conditions.

29. The same shackle line is often used for birds of different species and for large and small sized birds of the same species and there is a danger that the design of the shackles may not be suitable for every type and size of bird. It is essential that birds should be held firmly in position on the shackles and we consider that there may be scope to improve the design to achieve this. We recommend that research should be undertaken into shackle design.

30. We observed that in a processing plant where loose crates were used, the shackle line passed immediately above the line of crates from which birds were being removed but that their heads failed to clear the crates passing underneath them on the conveyor. Elsewhere we noticed that when being closed after removal of the birds, the hinged flaps of the crates projected into the line of birds hanging on the shackles. We have also seen that apertures in walls through which shackle lines pass were sometimes too small to allow birds to pass through freely when their wings were partly outstretched. As a result, they were dragged through. If the birds are startled or disturbed by staff passing near to them, or for any other reason, they may injure themselves by attempting to fly up in the shackles. We recommend that shackle lines should be designed and positioned to keep the birds clear of all obstructions and reduce disturbance to a minimum.

31. Birds which escape and wander around the plant may well be accidentally killed or injured. We recommend that operators should ensure that all loose birds are frequently collected.

32. The European Convention for the Protection of Animals for Slaughter lays down that "Poultry ..... may be suspended for slaughtering provided that stunning takes place directly after suspension". It seems desirable, however, that there should be sufficient time for the birds to settle before they reach the stunner. After a short period of wing flapping and other signs of disturbance, when first placed in the shackles, most birds remain still. We recommend that research should be undertaken to establish the minimum period for which birds should be suspended, head-downwards, before being stunned and that the period should be incorporated in the Slaughter of Poultry (Humane Conditions) Regulations 1971.

33. The Slaughter of Poultry (Humane Conditions) Regulations 1971 lay down that domestic fowls and turkeys must not be suspended head-downwards for more than 3 minutes and 6 minutes respectively before being slaughtered or stunned for the purpose of being slaughtered. We understand that these periods were based on commercial practice and that there was no investigation into the periods best suited to the welfare of the birds. We recommend that research should be undertaken to establish the maximum periods for which turkeys and domestic fowls are allowed to be suspended, head-downwards, before being stunned or slaughtered and that, if necessary, The Slaughter of Poultry (Humane Conditions) Regulations 1971 should be amended accordingly. We further recommend that, after research, the 1971 Regulations should prescribe the maximum periods for which all species of poultry may be suspended, head-downwards, before being stunned or slaughtered.

34. The Slaughter of Poultry (Humane Conditions) Regulations 1971 require any bird which may reasonably be supposed to be in pain because of injury or any other cause to be slaughtered immediately. This should prevent birds which are found to be injured when unloaded from being placed on the shackle line. However, unloading staff will not necessarily identify injured birds. Even if they do, they may not have been trained, or they may be naturally reluctant, to kill them immediately by hand, preferring to place such birds on the shackles for slaughter in the usual way. To some extent the ante-mortem inspection required by The Poultry Meat (Hygiene) Regulations 1976, as amended, when this takes place after unloading but before stunning, provides an opportunity for the identification and immediate killing of injured birds but this inspection may not be carried out continuously and is not required at all plants. We consider that not all injured birds are identified and slaughtered straightaway and we recommend that closer attention be paid to the requirement of the 1971 Regulations. We are also concerned that birds found to be suffering from painful injuries when taken out of their crates will almost certainly have been suffering pain from those injuries during transit and whilst waiting for the consignment as a whole to be unloaded. We recommend that, unless a consignment of birds is to be unloaded as soon as it arrives at a processing plant, it should be inspected to identify any birds with injuries thought likely to be causing pain and that such birds should be immediately slaughtered in accordance with the 1971 Regulations.

#### *Stunning*

35. It is a requirement of the Slaughter of Poultry Act 1967 that poultry which are slaughtered for preparation for sale for human consumption shall first be stunned to render them instantaneously insensible to pain until death supervenes. The requirement does not apply if slaughter is instantaneously carried out by decapitation or dislocation of the neck. Nor does it apply if poultry are slaughtered by Jewish or Muslim methods.

36. The equipment commonly used for stunning in poultry processing plants is the electrically charged water bath. Whilst the birds are suspended on the shackles, their heads are intended to come into contact with the water and the passage of an electric shock through the brain should render them unconscious. The procedure aims to produce unconsciousness but not death since it is held that the heart must continue to function to ensure maximum loss of blood following venesection.

37. We understand that the industry considers the electrical water bath to be the most effective and humane method of stunning. During the course of

our visits to processing plants, managements expressed few reservations about the system and assured us that nearly 100% of the birds were properly stunned. Nevertheless, we are not confident that electrical stunning of poultry is as reliable as it is claimed to be.

38. The physiological aspects of the stunning of poultry are not well understood and criteria for establishing insensitivity to pain, suitable for use in working conditions, may well be unreliable. The presence of the corneal reflex is often used to determine that a bird is sensitive to pain and we have noted that the report on the Review of Pre-slaughter Stunning in the European Community <sup>(a)</sup> found the reflex to be present in a substantial number of poultry after stunning. However, the absence of the reflex, which is normally assumed to indicate insensitivity to pain, may well be due to the effect of the shock on the muscles, and pain may still be felt. We consider that the presence or absence of the corneal reflex is not a reliable indicator of sensitivity to pain. The best available guide that stunning has been effective is probably the manifestation of the characteristic signs <sup>(b)</sup> of an electroplectic fit, that is:—

an arched neck with head directed vertically;

opened eyes;

rigidly extended legs and a body which shows constant, rapid, muscle tremors, and

wings held close to the body displaying short bursts of restricted wing flaps.

During our visits, we were satisfied that such signs were not always to be seen. We believe it to be too readily assumed that poultry are properly stunned after passing through the electrical water bath stunner. Superficially, the birds may, indeed, appear to have been stunned but we consider that a substantial number may still be sensitive to pain. We recommend that the effectiveness of stunning should always be judged on the basis of the characteristic signs of an electroplectic fit until such time as more reliable criteria may become available as a result of research (see paragraph 40).

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(a) Published by the Commission of the European Communities in the series Information on Agriculture: No. 30, March 1977.

(b) As described to the Council by Professor Kuenzel, Department of Poultry Science, University of Maryland.

39. At the other end of the scale, we have noted that the report on the Review of Pre-slaughter Stunning in the European Community also referred to a substantial number of birds which were killed as a result of the shock delivered by the stunner. Our own observations support this. Some birds which, at our request, were removed from the shackles after stunning showed no signs of recovering consciousness after 3 or 4 minutes and it is almost certain that they, and other birds passing through the stunner at the same time, were killed.

40. We are concerned that large numbers of poultry may not be stunned before slaughter so as to render them insensible to pain until death supervenes and we recommend that research should be undertaken to determine the extent and nature of the problem and to make the stunning process fully reliable. Research should also be initiated to endeavour to set criteria, capable of being applied in working conditions, to establish whether or not poultry have been effectively stunned.

41. Reasons why stunning may not be satisfactory include:—

- (i) a tendency to set the voltage of the stunner too low in order to avoid killing the birds;
- (ii) incorrect immersion of the birds in the water bath affecting the path of the electric current through them;
- (iii) variations in the electrical resistance of birds and of different parts of birds;
- (iv) failure of the stunner to operate at full efficiency or inefficient earthing of the shackle line;
- (v) variations in the current;
- (vi) failure to adjust the height of the water bath to the size of birds being stunned;
- (vii) variation in the susceptibility of birds to electric shock;
- (viii) movement of the birds when entering the stunner so that they escape contact with the water or do not make proper contact with it (Such movement can be stimulated by a premature shock if the entry ramp has become wet. Provided that there is no problem of this kind

however, a ramp appears to reduce the amount of disturbance shown by the birds when entering the water bath by gradually raising their heads to the level of its edge.)

The need to ensure that equipment is at all times in good working order cannot be over-emphasised and we recommend that managements should carry out daily inspections (recorded in a log book), regular servicing and immediate repairs when necessary.

42. Other methods of electrical stunning are also used although very few birds are involved by comparison with the numbers that pass through water bath stunners. It was noticeable to us that at farms and other premises where stunning was carried out by hand using tongs or an electric knife, the number of birds being slaughtered allowed careful attention to be given to each one with, apparently, satisfactory results. It seems to us that stunning by hand, properly and carefully carried out, is probably a reliable method. It also seemed to us that reliable results were achieved at a plant where a shackle line was in use and, under the continuous supervision of an operative, the heads of the birds were guided by rail on to an electrified bar. However, in this case, stunning was followed almost immediately by venesection and it was not possible to see whether the stunned birds displayed signs of an electroplectic fit. We recommend that venesection should occur between 10 and 15 seconds after stunning and that research should be undertaken to establish more precisely the time required for each species.

43. Since the welfare of birds stunned by automatic or hand-operated equipment requires the equipment to be functioning properly, it is clearly important that operating staff should know the setting required for different types of poultry and that they should be immediately aware of any failure of the equipment to operate at maximum efficiency. We recommend that equipment should incorporate visual and audible warning devices to indicate any failure and that full operating instructions, including the settings required for different types of poultry, should be provided by manufacturers, and displayed near the installation.

44. It is also essential that operating staff should know in advance what action to take in the event of a failure of the stunner to work at maximum efficiency and we recommend that managements should ensure that operatives are fully conversant with the emergency procedures to be followed when any fault develops in the stunning equipment.

45. We consider it essential for precautions to be taken against the risk that birds may escape stunning or may not be properly stunned. At some plants an operative is present to provide manual "back-up" for the automatic stunner. We recommend that manual "back-up" should always be required by law during the whole of the time that an automatic electrical stunner is in operation. We further recommend that those birds which have not been stunned to the satisfaction of the operative should be killed instantaneously by him by means of dislocation of the neck or properly stunned with a hand-held stunner. We are not in favour of such birds being removed from the shackle line and replaced on it for a second passage through the stunner.

46. We have already referred (paragraph 39) to birds which are killed by the electric shock intended to stun them. According to the generally held view in the industry, the cessation of heart action in these birds would have adversely affected bleeding out. Nevertheless, no problems of this sort were encountered. This leads us to question the generally held view that satisfactory bleeding out is dependent on continued heart action and that birds must, therefore, be stunned and not killed before venesection. If it could be established that birds which are killed by an electric shock bleed out as satisfactorily as those which are stunned, the incentive to apply the lowest possible strength of current so as to avoid killing them would no longer exist and this cause of ineffective stunning would be removed. In our view, a simple investigation would provide the answer and we recommend that tests be undertaken quickly to ascertain how the bleeding out of stunned birds compares with the bleeding out of birds that have been killed instantaneously.

47. The Slaughter of Poultry Act 1967 requires poultry which are being slaughtered for preparation for sale for human consumption to be stunned by means of an instrument of a kind approved by Ministers. We understand that the Agriculture Ministers announced in 1969 that an approved instrument would be "an instrument which passes an electric current through the brain of a bird sufficient to render the bird instantaneously insensible to pain" and that it has not been the policy of the Departments to approve individual appliances. We consider that official approval of stunning equipment ought to provide an important welfare safeguard and that such approval should be given only when the Departments are satisfied that any given apparatus is capable of complying with the provisions of the Act. In our view, the method of "blanket" approval at present adopted by the Departments does not provide adequate official assurance that equipment will instantaneously render poultry insensible to pain, as required by the Act. We recognise that approval of each individual appliance may be impracticable but we recommend that each type of stunner made by any manufacturer should be subject to approval by the appropriate Department.

48. The introduction of arrangements for departmental approval of each new type of stunner would mean that the performance of existing stunners in use would remain unchecked. We recommend that the continued use of stunners already installed should be subject to approval by Departments.

49. The knowledge and experience of stunning equipment accumulated by Departments as a result of their approval of different types should, we consider, be made available to manufacturers and processors and we recommend that Departments should issue guidelines on the design and use of stunning equipment kept up-to-date with reference to results of research.

50. We understand that the use of carbon dioxide to make birds insensible to pain before slaughter is considered by the industry to be impracticable in processing plants handling poultry at high speed. However, it is possible that the use of carbon dioxide might give more consistent results than electrical stunning. It would allow birds to be rendered insensible to pain whilst remaining in their crates and the risk of injury and distress associated with removal from crates and hanging on the shackles would be avoided. We consider that the use of carbon dioxide to render birds insensible to pain before slaughter might have substantial advantages and recommend research into the practicability of the method.

#### *Slaughter*

51. After the birds have passed through the stunner, venesection should be performed well before they recover consciousness so that the loss of blood results in death prior to entry into the scald tank. Venesection may be carried out either mechanically or manually but, whichever method is used, it is essential for the cut to be made properly to ensure satisfactory bleeding.

52. Automatic throat cutters are designed to cut the neck with precision in order to ensure the loss of blood will cause death before the birds enter the scald tank. However, the efficiency with which the cut is made is influenced by such factors as variations in size of bird and the maintenance of the machine and cutting wheel, and some birds miss the cutter completely. When the cut is not properly made, and satisfactory bleeding fails to take place, some birds will enter the scald tank before they are dead and some may display obvious signs of consciousness. It is often the normal practice in poultry processing plants for manual "back-up" to be provided for automatic throat cutting machines as a precaution against failure to function correctly. We consider this essential and recommend that the industry should be required by law to provide manual "back-up" by an operator trained to slaughter poultry when automatic throat cutting machines are used.

53. There is also a risk with manual cutting that birds may be missed or not properly cut and the speed of the line may accentuate the problem. By its nature the operation of cutting the birds is bound to be "messy". We consider that the work is sometimes carried out in unduly cramped and repulsive conditions which may adversely affect the efficiency of the operatives. We recommend that staff who perform venesection by hand, whether working as a "back-up" to an automatic throat cutter or directly on the line, should be given reasonable space to work in, that the work area should be kept as clean as possible and that it should be provided with washing facilities, including washing facilities for protective clothing. We also recommend that the number of staff engaged on the work should be adjusted to the line speed so as to ensure that staff are given time to cut each bird satisfactorily. Because it is vital for staff engaged on the work not to lose concentration, even momentarily, and so as to ensure that they remain fully efficient, we further recommend that such staff should always be given regular and frequent breaks.

54. The discoloration of some carcasses after scalding ("redskins") is generally attributed to unsatisfactory bleeding. However, this explanation of "redskins" is not supported by an account we have received of a test at a processing plant where *dead* birds which had not been bled did not become "redskins". Such a result raises the question of whether the red skin may be an inflammatory reaction in birds which are not dead, or have not been dead for a sufficient length of time, when they are plunged into the scald tank. We consider that this uncertainty makes it all the more important for the tests recommended at paragraph 46 to be carried out as a matter of urgency.

55. The Slaughter of Poultry (Humane Conditions) Regulations 1971 require turkeys and domestic fowls to be allowed to bleed for at least 2 minutes and 1½ minutes respectively after venesection and before immersion in a scald tank or before plucking and we understand that these periods were based on commercial practice. No such periods are laid down for any other species of poultry. We believe that statutory minimum bleeding times should be based on investigations into time taken to bleed to death rather than on commercial practice and that they should be prescribed for all species of poultry. We also believe that there may be variation in the bleeding time necessary for different sized birds of the same species and that the single times at present laid down for all turkeys and all domestic fowls may be too general. We recommend that minimum periods for bleeding after venesection should be laid down for all species of poultry and that research should be undertaken to establish such minimum periods.

56. Elsewhere in this report we express our concern that not all poultry at processing plants receive the protection required by law. In addition, we were shocked to find that some types of business activity escape the law with the result that the birds are excluded from the legal protection that normally applies. At businesses we visited where slaughter was carried out by the Muslim method for the food of Muslims the birds were kept on the premises and slaughtered in the most squalid conditions. Nothing can apparently be done about it by the authorities as the birds are sold to the customer live and slaughtered for him immediately *afterwards*. We understand that this type of trade is outside the scope of the Slaughter of Poultry Act 1967 which relates only to poultry slaughtered *before* being sold for human consumption. For the same reason, neither The Slaughter of Poultry (Humane Conditions) Regulations 1971 nor The Poultry Meat (Hygiene) Regulations 1976 apply but the businesses would probably be exempt from the latter Regulations on other grounds. Although questions of hygiene are outside our terms of reference, we were surprised that poultry meat for human consumption could be prepared in such conditions.

57. The same point concerning the application of the Slaughter of Poultry Act 1967 only to poultry "slaughtered for purposes of preparation for sale for human consumption" has been referred to in written evidence we have received about poultry slaughtered in markets. Here also, the slaughter of birds which are sold live and killed afterwards is not subject to the 1967 Act and it is said that killing can be badly carried out and cause great suffering especially to heavy birds such as turkeys. We are concerned at the existence of this loophole in the law and recommend that the Slaughter of Poultry Act 1967, as amended, and The Slaughter of Poultry (Humane Conditions) Regulations 1971 should apply to the slaughter of all poultry irrespective of whether they are sold live or dead and irrespective of whether or not they are sold for human consumption.

#### *Supervision, training and licensing*

58. We have already stated in this report our belief that there is rarely deliberate cruelty to the birds but that pain or distress may be caused by lack of knowledge, carelessness or unsympathetic treatment (paragraph 7). It seems to us that when large numbers of birds are processed in factory-like conditions, there is a very real risk that they will cease to be looked upon as individual creatures capable of feeling pain or distress. All staff who handle birds at any stage up to the point of death must have constant regard to the overriding need for their humane treatment. We believe that staff will continue to be conscious of their responsibility only if managements themselves insist on satisfactory welfare of the birds at all stages and provide

sufficient senior staff to ensure, by close supervision, that such a policy is adhered to. We recommend managements to ensure that supervisory staff are suitably trained and made specifically responsible for the welfare of the birds from the time of arrival at the processing plant to the time of death.

59. The humane treatment of the birds also depends on all operating staff having received suitable training, whether they work within the plant or are concerned with the transport of poultry to the plant. Training acquired by doing the job alongside experienced staff may perpetuate bad habits and does not ensure that staff gain the necessary understanding which is essential if the need for satisfactory welfare and its importance is to be fully appreciated. We recommend that there should be formal in-plant training arrangements in all processing plants.

60. It is particularly important that staff who operate stunning or automatic venesection equipment, or who perform manual venesection, should demonstrate that they possess the skill and knowledge required to do the job effectively. We recommend that staff should be employed on stunning or on automatic or manual venesection of poultry only if licensed by the local authority as competent to perform these functions.

#### *Legislation and enforcement*

61. The law relevant to the welfare of poultry on premises where they are to be slaughtered is contained in:—

The Protection of Animals Act 1911

The Conveyance of Live Poultry Order 1919

The Slaughter of Poultry Act 1967 as extended by The Slaughter of Poultry Act 1967 Extension Order 1978

The Slaughter of Poultry (Humane Conditions) Regulations 1971

The Transit of Animals (General) Order 1973.

However, we are at present considering in detail proposals that Departments have circulated for a new Order to protect the welfare of poultry in transit which will replace the 1919 Order and, in so far as it relates to poultry, the 1973 Order.

62. The Council believes that, subject to those recommendations contained in this report which would require amendment of the law (see paragraphs 21, 24, 32, 33, 45, 52, 55 and 57), these Acts and Orders are capable of providing satisfactory welfare protection if adequately enforced. However, we are concerned that the law is not always observed and that, in practice, poultry do not receive the protection which is legally required. In particular, the requirement of Section 1 (1) of the Slaughter of Poultry Act 1967 that "no [poultry] ..... shall be slaughtered, for purposes of preparation for sale for human consumption unless ..... it is, by stunning .... instantaneously rendered insensible to pain until death supervenes" would appear to be contravened whenever stunning is not effectively carried out. We consider that more vigorous enforcement would be a strong incentive to operators to keep a close watch on the effectiveness of stunning and recommend that the appropriate authorities should act accordingly.

63. Since August 1979 it has become necessary, in order to comply with The Poultry Meat (Hygiene) Regulations 1976, as amended, for Official Veterinary Surgeons (OVS) to be present in all licensed poultry processing plants during at least part of each day and for Poultry Meat Inspectors to be present during the whole time that the slaughtering plant is in operation. OVSs are appointed by and are responsible to local authorities for the hygiene of the plant and its products. We understand that OVSs are sometimes, but not always, also made responsible for supervising the welfare of the poultry. We consider that the presence of OVSs has helped to raise standards of welfare and recognise that, whether or not the welfare of poultry is formally made his responsibility, an OVS would be bound by his professional ethics to take a close interest in the matter. We also recognise the contributions made by Environmental Health Officers and Poultry Meat Inspectors to the welfare of the birds. Nevertheless, we recommend that the OVS, as the enforcing authority's representative on the spot, should be formally made responsible for the supervision of the welfare of the birds, that he should be required to report to the local authority any breaches of welfare regulations and to spend sufficient time at the plant each day to carry out these duties.

## SUMMARY OF RECOMMENDATIONS

### *Design of plant and equipment*

64. (1) All poultry processing plants should meet the following requirements:—

- (i) holding accommodation for birds awaiting slaughter should provide proper ventilation and proper protection from the weather;
- (ii) unloading arrangements should be such as to avoid unnecessary disturbance of birds;

(iii) the system of moving loose crates containing birds from the lorry to the point at which the birds are removed from them should be such as to avoid any jolting or undue tilting of the crates;

(iv) unloading and shackling arrangements should be designed to reduce to a minimum the physical effort required by the staff;

(v) the positioning of the shackle line should ensure that the suspended birds are kept well clear of all obstructions, even when their wings are outstretched;

(vi) the whole length of the shackle line up to the point of entry into the scald tank should be immediately accessible to staff so that birds can, if necessary, receive attention;

(vii) there should be ready access to all processing equipment and its controls;

(viii) working conditions for staff should provide adequate space and light, and be hygienic, well ventilated, draught-free, dry (where possible) and dust-free;

(ix) the speed of the shackle line should be limited to that which enables staff to perform their tasks efficiently, without undue haste and with proper regard for the welfare of the birds (paragraph 9).

(2) Firms and individuals planning to install new or modified facilities for the slaughter of poultry for human consumption should first seek advice from the appropriate local authority on the provisions to be made for the welfare of the live birds (paragraph 10).

### *Crating*

(3) The Agriculture Departments should draw the attention of local authorities to the desirability of more stringent enforcement of the regulations contained in the Transit of Animals (General) Order 1973 in so far as they relate to methods of transporting and handling poultry (paragraph 20).

(4) The Agriculture Departments should draw the attention of local authorities to their responsibility for enforcing the provisions of The Slaughter of Poultry (Humane Conditions) Regulations 1971 requiring poultry awaiting slaughter to be protected from the direct rays of the sun and from adverse weather and to be provided with adequate ventilation (paragraph 21).

(5) All processing plants should be required by law to have enclosed bays or other similar accommodation equipped with forced ventilation and a humidifying system (paragraph 21).

(6) The period between loading the first bird of a consignment into a crate until the last one is unloaded at the processing plant should be limited by law to 12 hours (paragraph 24).

(7) All firms should have contingency plans to ensure that birds awaiting slaughter are not held in excess of the time limit referred to in recommendation (6) above in the event of mechanical breakdown of a plant or other interruption of the processing line (paragraph 25).

#### *Unloading and shackling*

(8) Managements should ensure that the operation of removing poultry from crates and hanging on shackles is under the direct and constant control of supervisory staff (paragraph 27).

(9) All managements should ensure that their system of transferring birds from crates to shackles provides the best possible working conditions (paragraph 28).

(10) Research should be undertaken into shackle design (paragraph 29).

(11) Shackle lines should be designed and positioned to keep the birds clear of all obstructions and reduce disturbance to a minimum (paragraph 30).

(12) Operators should ensure that all loose birds are frequently collected (paragraph 31).

(13) Research should be undertaken to establish the minimum period for which birds should be suspended, head-downwards, before being stunned and the period should be incorporated in The Slaughter of Poultry (Humane Conditions) Regulations 1971 (paragraph 32).

(14) Research should be undertaken to establish the maximum periods for which turkeys and domestic fowls are allowed to be suspended, head-downwards before being stunned or slaughtered and, if necessary, The Slaughter of Poultry (Humane Conditions) Regulations 1971 should be amended accordingly. We further recommend that, after research, the 1971 Regulations should prescribe the maximum periods for which all species of poultry may be suspended, head-downwards, before being stunned or slaughtered (paragraph 33).

(15) Closer attention should be paid to the requirement of The Slaughter of Poultry (Humane Conditions) Regulations 1971 for any bird which may reasonably be supposed to be in pain because of injury or any other cause to be slaughtered immediately (paragraph 34).

(16) Unless a consignment of birds is to be unloaded as soon as it arrives at a processing plant, it should be inspected to identify any birds with injuries thought likely to be causing pain and such birds should be immediately slaughtered in accordance with the 1971 Regulations (paragraph 34).

### *Stunning*

(17) We recommend that the effectiveness of stunning should always be judged on the basis of the characteristic signs of an electroplectic fit until such time as more reliable criteria may become available as a result of research (paragraph 38).

(18) Research should be undertaken to determine the extent and nature of the problem that a large number of poultry may not be stunned before slaughter so as to render them insensible to pain until death supervenes, and to make the stunning process fully reliable. Research should also be initiated to endeavour to set criteria, capable of being applied in working conditions, to establish whether or not poultry have been effectively stunned (paragraph 40).

(19) Managements should ensure that stunning equipment is at all times in good working order by carrying out daily inspection (recorded in a log book), regular servicing and immediate repairs when necessary (paragraph 41).

(20) Venesection should occur between 10 and 15 seconds after stunning and research should be undertaken to establish more precisely the time required for each species (paragraph 42).

(21) Stunning equipment should incorporate visual and audible warning devices to indicate any failure and full operating instructions, including the settings required for different types of poultry, should be provided by manufacturers, and displayed near the installation (paragraph 43).

(22) Managements should ensure that operatives are fully conversant with the emergency procedures to be followed when any fault develops in the stunning equipment (paragraph 44).

(23) Manual "back-up" should always be required by law during the whole of the time that an automatic electrical stunner is in operation. Birds which have not been stunned to the satisfaction of the operative should be killed instantaneously by him by means of dislocation of the neck or properly stunned with a hand-held stunner (paragraph 45).

(24) Tests should be undertaken quickly to ascertain how the bleeding out of stunned birds compares with that of birds which have been killed instantaneously (paragraph 46).

(25) Each type of stunner made by any manufacturer should be subject to approval by the appropriate Agriculture Department (paragraph 47).

(26) The continued use of stunners already installed should be subject to approval by Agriculture Departments (paragraph 48).

(27) Agriculture Departments should issue guidelines on the design and use of stunning equipment kept up-to-date with reference to the results of research (paragraph 49).

(28) Research should be undertaken into the practicability of using carbon dioxide to render birds insensitive to pain before slaughter (paragraph 50).

### *Slaughter*

(29) The industry should be required by law to provide manual "back-up" by an operator trained to slaughter poultry when automatic throat cutting machines are used (paragraph 52).

(30) Staff who perform venesection by hand, whether working as a "back-up" to an automatic throat cutter or directly on the line, should be given reasonable space to work in and the work area should be kept as clean as possible and provided with washing facilities, including washing facilities for protective clothing. The number of staff engaged on venesection should be adjusted to the line speed so as to ensure that staff are given time to cut each bird satisfactorily; such staff should always be given regular and frequent breaks (paragraph 53).

(31) Minimum periods for bleeding after venesection and before immersion in a scald tank, or plucking, should be laid down for all species of poultry (not only turkeys and domestic fowls) and research should be undertaken to establish such minimum periods (paragraph 55).

(32) The Slaughter of Poultry Act 1967, as amended, and The Slaughter of Poultry (Humane Conditions) Regulations 1971 should apply to the slaughter of all poultry irrespective of whether the birds are sold live or dead and irrespective of whether or not they are sold for human consumption (paragraph 57).

#### *Supervision, Training and Licensing*

(33) Managements should ensure that supervisory staff are suitably trained and made specifically responsible for the welfare of the birds from the time of arrival at the processing plant to the time of death (paragraph 58).

(34) There should be formal in-plant training arrangements in all processing plants (paragraph 59).

(35) Staff should be employed on the stunning or on the automatic or manual venesection of poultry only if licensed by the local authority as competent to perform these functions (paragraph 60).

#### *Legislation and enforcement*

(36) The appropriate authorities should enforce more vigorously the Slaughter of Poultry Act 1967 to provide a stronger incentive to operators to keep a close watch on the effectiveness of stunning (paragraph 62).

(37) The Official Veterinary Surgeon, as the enforcing authority's representative on the spot, should be made formally responsible for the supervision of the welfare of the birds and should be required to report to the local authority any breaches of welfare regulations and to spend sufficient time at the plant each day to carry out these duties (paragraph 63).

ORGANISATIONS AND INDIVIDUALS WHO GAVE WRITTEN OR ORAL EVIDENCE

The following gave written and oral evidence:—

Association of Meat Inspectors

Mr A F Wheeler

Mr R A Blowers

Mr C B Bonsall

Mr A L Hume

Agricultural Development and Advisory Service

Mr J A Binstead, Poultry Meat Specialist

British Poultry Federation

Mr J Maunder

Mr W J Williams

Environmental Health Officers' Association

Mr C J Wadey

Mr J Clark

Mr R Sankey

Lindholst and Co A/S

Mr P Kjeldsen

Mr J Sewell

Poultry Research Centre

Dr I J H Duncan

Professor W Kuenzel

The following gave written evidence:—

Animal Health Trust

Association of District Councils

Association of Meat Inspectors (GB) Ltd

Association of Metropolitan Authorities

British Veterinary Association

Central Council of Societies in Scotland for Prevention  
of Cruelty to Animals

Convention of Scottish Local Authorities  
Cope and Cope Limited  
Council for the Principality  
Council of Justice to Animals and Humane Slaughter Association  
Environmental Health Association  
Farm and Food Society  
Farm Animal Welfare Co-ordinating Executive  
Farmers Union of Wales  
Mr G B S Heath FRCVS  
Houghton Poultry Research Station  
Marks and Spencer Limited  
National Council of Women of Great Britain  
National Farmers' Union  
National Union of Agricultural and Allied Workers  
Poultry Research Centre  
Royal College of Veterinary Surgeons  
Royal Society for the Prevention of Cruelty to Animals  
Mr Cecil Schwartz MRCVS  
Universities Federation for Animal Welfare  
University of Liverpool – Faculty of Veterinary Science

Copies may be obtained c/o

The Ministry of Agriculture,  
Fisheries and Food  
(Publications)  
Lion House  
Willowburn Trading Estate  
Alnwick