Report on the Welfare of Farmed Animals at Slaughter or Killing

Part 1: Red Meat Animals

June 2003

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CONTENTS

FOREWARD

Since FAWC last considered the welfare of farmed animals at slaughter in the mid 1980's, there have been major changes in the structure of farming but perhaps even more so in the structure of the slaughter industry.

The decline in the number of slaughterhouses noted in our 1985 report has continued. The year 1995 saw the introduction of the Welfare of Animals (Slaughter or Killing) Regulations (commonly known as WASK) with, at the same time, the creation of the Meat Hygiene Service and the requirement for an Official Veterinary Surgeon (OVS) to be present in all slaughterhouses.

We have seen new technologies introduced for stunning and killing and much new research that has advanced our understanding of animal welfare during the slaughter process. Likewise, much has been learned in recent years about design features for slaughterhouses that can have great benefit for the welfare of the animals being handled and processed.

Species that were not farmed in large numbers in the 1980's, such as deer, ostrich and wild boar, are now being produced for human consumption and deserve special consideration to assure their welfare at slaughter. The recent outbreaks of exotic diseases in the UK (Classical Swine Fever in 2000 and Foot and Mouth Disease in 2001) have highlighted the welfare problems involved in slaughtering large numbers of animals over short periods outside the controlled environment of the slaughterhouse. In addition, consumers rightly expect safe meat in the face of a number of zoonotic diseases, such as BSE and E.coli 0157. However, the achievement of these high safety standards must not be at the expense of welfare.

All these issues and many more are addressed in this report and we make a number of significant recommendations. These include the phasing out of the use of aversive gases as a means of stunning pigs, the use of improvement notices as enforcement sanctions, restriction on the presentation of horned cattle at slaughterhouses, the need for a system of approval for slaughter equipment and the need for periodic re-assessment of the competence of those holding slaughter licences.

Some of our recommendations can be adopted simply by changes to working practices. Others will require changes to the legislation. In each case we have tried to make it clear whose responsibility we believe it is to take the recommended action and what specifically needs to be done.

We recognise there may be strong reactions to our recommendations with regard to slaughter of animals without pre-stunning both from the religious groups affected and from the wider animal welfare community. Our recommendations are based upon our concern for the welfare of the animals involved. We make no moral judgement. I sincerely hope that attention is not drawn away from the overall value of the report and

the many significant recommendations which we make for the benefit of all animals which are slaughtered for human consumption.

Dr Judy MacArthur Clark
Chairwoman of FAWC

PART I
INTRODUCTION

1. The Farm Animal Welfare Council (FAWC) was established in 1979. Its terms of reference are to keep under review the welfare of farm animals on agricultural land, at market, in transit and at the place of slaughter; and to advise Great Britain's Rural Affairs Ministers of any legislative or other changes that may be necessary. The Council has the freedom to consider any topic falling within this remit.

FAWC's philosophy

2. Animals are kept for various purposes and in return their needs should be provided for. Farm animals are recognised as sentient beings in the Treaty of Amsterdam. We have a moral obligation to each individual animal that we use. This obligation includes never causing unnecessary harms to animals and, when deciding on our actions, endeavouring to balance any other harms against benefits to humans and/or other animals.

3. The achievement of high standards of animal welfare requires awareness of animal needs and both caring and careful efforts on the part of all who are involved in the supervision of farmed animals. Those in charge of, or who have responsibility for, livestock must involve themselves in: responsible and responsive management; informed, skilled and conscientious stockmanship; considerate handling and transport; and humane slaughter. General guidelines as to what those who use animals should provide in order to avoid suffering and other harms, are contained in the five freedoms:

freedom from hunger and thirst, by ready access to fresh water and a diet to maintain full health and vigour;
freedom from discomfort, by providing an appropriate environment including shelter and a comfortable resting area;
freedom from pain, injury and disease, by prevention or rapid diagnosis and treatment;
freedom to express normal behaviour, by providing sufficient space, proper facilities and company of the animal's own kind;
freedom from fear and distress, by ensuring conditions and treatment which avoid mental suffering.

4. When assessing any welfare problem, it is necessary to consider both the extents of poor welfare and its duration. Welfare assessment concerns individual animals. However, where there are indications of poor welfare, we consider that the more animals which are affected, the more serious is the problem.

5. In order to offer useful advice about the welfare of farm animals, FAWC takes account of scientific knowledge and the practical experiences of those involved in the livestock industry. A broad-ranging approach, taking into account all relevant views and attempting to balance human benefit with a concern to ensure that the animal's interests remain to the fore, is used in the formulation of FAWC recommendations. Furthermore,

FAWC considers that British welfare standards or equivalents should apply not only to farm animals which are produced within Great Britain, but also to those produced in any other country which are then used as a food or ingredient source for Great Britain.

6. Knowledge based on scientific studies of the welfare of animals is increasing rapidly. The term animal welfare is employed frequently in scientific and legal documents and in public statements. In our view, welfare encompasses the animal's health and general physical condition, its mental state, its biological fitness and its ability to cope with any adverse effects of the environment in which it finds itself.

Specific slaughter issues

7. There will always be ethical and moral issues as to whether or not an animal should be killed, whether it is for food, disease control, an unwanted animal in the production system or suffering from disease or injury. The debate surrounding these issues is not within the scope of this report but Council did consider how best animal welfare can be protected once the decision has been made to kill an animal. The killing method should always cause minimal distress to the animal. However, this may only be the final stressor in a sequence of equally or more stressful events. Aside from the transport and handling of the animal before it reaches the slaughterhouse, animals are then unloaded into a strange environment where they are subjected to further handling, lairage and inspection. Any consideration of the welfare of livestock submitted for slaughter must therefore consider the whole chain of events involved.

8. The Council believes that, when specifically addressing the welfare of animals at slaughter and killing, the basic principles that must be observed are:

- **pre-slaughter handling facilities which minimise stress;**
- **use of competent well trained, caring personnel;**
- **appropriate equipment which is fit for the purpose;**
- **an effective process which induces immediate unconsciousness and insensibility or an induction to a period of unconsciousness without distress; and**
- **guarantee of non-recovery from that process until death ensues.**

9. Scientific and practical assessments of animal welfare in relation to the events up to the point of slaughter or killing encompass: physiological changes, abnormalities of behaviour, or changes in the brain which show the extent to which the animal is having difficulty in coping or is failing to cope; the extent of injury or of bodily malfunction; and the extent to which animals must contend with situations which they would strongly avoid if they were able to do so. Although one single measurement can indicate that welfare is poor, welfare assessment should cover the use of a range of indicators.

10. The terms slaughter and killing are distinguished in the legislation.

- ""slaughter", in relation to an animal, means causing the death of the animal by bleeding".
- ""killing", in relation to an animal, means causing the death of the animal by any process other than slaughter".

11. Death can be defined as the cessation of the vital functions of an animal. In animal welfare terms, this point must be reached either instantaneously or after the animal has first been rendered unconscious by another means. The method of rendering the animal unconscious should also be achieved without causing it distress. Evaluation of the effectiveness or otherwise of different stunning, slaughter or killing methods also relies on a range of different indicators, for example, the time taken to induce unconsciousness, the duration of unconsciousness and the time to death. Observational methods for assessing that the animal is both unconscious and insensible to pain and that it is dead are also used to monitor stunning, slaughter and killing procedures.

Remit and methodology

12. In 1999, FAWC announced a review of the welfare of farm animals at slaughter. The Council had not studied this topic in detail since the mid-1980s and wished to re-assess welfare at slaughter in the light of new legislation, the Welfare of Animals (Slaughter or Killing) Regulations 1995 (WASK), the establishment of a new enforcement authority, the Meat Hygiene Service (MHS) and new developments in technology and design. The review was confined to the welfare of livestock from the time of arrival at the place of slaughter until death. This excluded loading, collection and transportation of animals to the slaughterhouse and all slaughterhouse operations following death. We have also taken into account on-farm slaughter and killing for disease control.

13. Whilst the remit originally included poultry, it was decided to concentrate on the welfare of red meat animals (cattle, sheep, pigs, wild boar, deer, horses and ostriches) at slaughter in the first instance. During the production of this report there were outbreaks of Classical Swine Fever and Foot and Mouth Disease. Killing methods in these circumstances were a subject covered in a FAWC Report published in January 2002. *Foot and Mouth Disease 2001 and Animal Welfare: Lessons for the Future* is available from the FAWC Secretariat or on the Website (http://www.fawc.org.uk).

14. The Council carried out an extensive consultation exercise, considered scientific evidence and members visited a wide-range of slaughterhouses in Great Britain and Europe, visited hunt kennels and took evidence in relation to field slaughter. In addition, meetings were held with invited experts from the industry and research bodies; oral and written evidence was taken from interested parties including animal protection organisations, and from experts in the field. Members visited Classical Swine Fever slaughter premises and some were directly involved with the Foot and Mouth Disease outbreak.

15. Those who gave evidence and information are listed at Appendix B and we should like to thank all who participated. In addition, we are grateful to those operators who allowed us access to their slaughterhouses and for the open and frank discussions we were able to hold with them and their staff.

16. Where we refer in our report to "Government" we are addressing ourselves to the Department for Environment, Food and Rural Affairs in England, the Scottish Executive's Environment and Rural Affairs Department, the Welsh Assembly's Agriculture and Rural Affairs Department and other responsible Government Departments and Agencies.

PART II
BACKGROUND

Structure of the slaughter industry

17. The 1984 FAWC Report on the Welfare of Livestock (Red Meat Animals) at the Time of Slaughter drew attention to a significant reduction in the number of slaughterhouses since 1968/9. Despite the building of some new premises this trend has continued and today less than 400 licensed slaughterhouses are operating in Great Britain.

Table 1: Red Meat Slaughterhouses in Great Britain 1979-2002

Date	England	Wales	Scotland	Total
1979	977	79	90	1,146
1980	959	62	89	1,110
1981	912	76	83	1,071
1982	841	70	81	992
1983	873	69	81	1,023
1984	861	70	79	1,010
1985	852	72	75	999
1986	815	71	73	959
1987	793	71	73	937
1988	782	65	68	915
1989	689	52	68	809
1990	643	60	64	767
1991	593	55	62	710
1992	542	54	60	656
1993	434	40	53	527
1994	424	40	48	512
1995	402	36	48	486
1996	384	37	49	470
1997	375	35	48	458
1998	360	34	43	437
1999	339	34	44	417
2000	316	34	44	404
2001*	305	32	41	378
2002	291	31	45	367

(There was some change of classification of slaughterhouses during the outbreak of Foot and Mouth Disease in 2001)*

Sources : The CVO Reports 1979 – 1997
Meat Hygiene Enforcement Report 1998 - 2002

18. Despite the reduction in premises, the number of red meat animals that are slaughtered in British slaughterhouses has not followed this trend. In some recent years there have been increases of up to 18% on numbers slaughtered in the early 1980's (although there is some variation by species). For example, in 1983 a total of 31.6 million animals were slaughtered (comprising 3.1m cattle; 14.1m sheep; and 14.4m pigs) and in 1998 the total slaughtered was 37.3m animals (2.3m cattle (-28%); 18.7m sheep (+33%); and 16.3m pigs (+13%)). Figures for 2000, 2001 and 2002 were 31.0 million, 24.6 million and 26.3 million respectively, possibly reflecting the exotic disease outbreaks recently suffered by the livestock industry. Numbers of animals from species other than cattle sheep and pigs slaughtered in licensed premises have increased in recent years, for example in 2002 throughput of deer was 83,935, horses 7,292, ostriches 3,024 and wild boar 1,292.

19. It has long been a FAWC premise that animals should be slaughtered as close to the point of production as possible. Rationalisation of the industry can have obvious implications for animal welfare. Slaughter is now concentrated in larger slaughterhouses and distances from farm or market to slaughter may increase accordingly. The risks of welfare being compromised are likely to increase with longer and/or more complex journeys. The quality and duration of transport plays a vital part in this equation. We have identified particular problems for classes of animals less suited to transport over long distances, e.g. cull sows and cast ewes. There are, at the time of writing, only two slaughterhouses for horses in Great Britain. However, pig processing plants have mainly concentrated in pig producing areas. There is also an effect on transport of livestock caused by the geographical distribution of retailer contracted slaughterhouses.

20. The Government is promoting the sourcing of food produced locally but slaughter capacity and distribution may not provide for this. The farm of origin may indeed be local to the retailer but animals may have made a long journey from the farm to the slaughterhouse before their end products are retailed locally. Economic factors along with compliance with meat hygiene regulatory requirements, have contributed to the considerable reduction in local slaughtering capacity.

Meat Hygiene Service

21. In 1995 a national Meat Hygiene Service (MHS) took over from Local Authorities responsibility for the enforcement of welfare at slaughter and meat hygiene regulations in slaughterhouses. Official Veterinary Surgeons (OVS) employed by the MHS must be present in all licensed slaughterhouses to oversee the treatment of the animals from their arrival at the slaughterhouse to the point of slaughter. Their duties extend to meat hygiene surveillance beyond the point of slaughter. The slaughterhouse operator remains responsible in law for the welfare of the animals in his care. The role of the OVS will be addressed later in this report. The MHS may also supply Meat Hygiene Inspectors (MHI). The MHS carries out a biennial animal welfare survey of slaughter premises in order to assess lairage, handling, stunning and killing systems.

PART III
THE WELFARE ISSUES

Design, construction and operation of the slaughterhouse

Unloading

General

22. Once animals enter the curtilage of a slaughterhouse the transporter and the slaughterhouse operator share the responsibility for their welfare. However, once unloading is completed, sole responsibility for the welfare of the animals rests with the slaughterhouse operator. There is a basic requirement to ensure animals are unloaded with the minimum of delay and in a manner that causes a minimum of stress or suffering. Unloading is the first point where slaughterhouse staff and enforcement officers can make an assessment of the health and well being of the animals. The condition of animals on their arrival may give an indication of both the standard of transport and of husbandry on the farm of origin. These assessments are not only important in terms of animal welfare but also in terms of surveillance of notifiable disease and public health. It is also at this point that decisions must be taken as to whether there is a need for immediate slaughter of animals on welfare grounds or to isolate those suspected of disease.

Arrival at the slaughterhouse

23. Once a vehicle arrives at a slaughterhouse it is in the animals' best interest that they are unloaded immediately. On a fully loaded vehicle, even in cold conditions, there will be a build up of heat and humidity that may compromise their wellbeing.

24. A number of slaughterhouses have introduced scheduling procedures in an effort to ensure animals can be off-loaded quickly. This system works well and should be encouraged particularly where there is limited lairage capacity. When lairage space, or the number of unloading points, is limited, vehicles may have to wait to unload. This situation could be exacerbated if there is a breakdown on the slaughter line, particularly at premises where throughput has increased over the years but lairage capacity has not matched that increase. National surveys have shown an average waiting time of some 23 minutes with individual vehicles sometimes waiting as long as 3-5 hours to unload. The latter situation is clearly unacceptable. Arrival and waiting times before unloading need to be monitored by the OVS who should take action directly or through the Local Authority as required. This will necessitate the keeping of records in higher throughput slaughterhouses.

Recommendations

25. Efficient scheduling procedures should be implemented by slaughterhouse operators so that animals do not have to wait to be unloaded.

26. If animals' waiting time on lorries regularly exceeds 30 minutes, it is incumbent on the OVS to take enforcement action.

Design of unloading area

27. A well designed, constructed and maintained unloading area can add to the speed and efficiency of unloading, consequently limiting the amount of stress on animals. The law requires that "suitable equipment and facilities" should be available for unloading animals, but does not specifically prescribe the need for purpose built, raised unloading bays.

28. We observed a wide interpretation of the law. Many premises had provided some form of raised unloading platform but often there was a lack of attention to detail in its design or situation. Our observations reinforced concerns expressed during the consultation process that knowledge about building of unloading facilities was not being widely translated into industry practice.

29. In both Great Britain and Europe the best designed facilities we observed had a number of common elements. Animals were able to walk off lorries onto a secure, level area that led directly into the lairage avoiding any sharp turns. Holding pens in line with the unloading bay, or slightly offset, exploit an animal's natural tendency to follow the group in front and allow for animals to continue to be unloaded as slaughterhouse staff pen animals in the lairage. Covered unloading areas allow lighting levels to be set to encourage animals to come off the vehicle. Unloading areas with solid sides rather than open rails facilitate unloading and prevent animals from being distracted or alarmed by external movements.

30. Animals dislike going downhill and therefore find descent down a steep ramp a stressful procedure and they risk injury from jumping, slipping or falling. Since the majority of slaughterhouses are required to deal with both livestock lorries and farm trailers, a raised unloading bay must be a basic requirement for all but low throughput premises (<20 livestock units per week).

Recommendations

31. Government should make it a legal requirement that slaughterhouses provide facilities to enable animals to exit lorries on the level, in all but low throughput slaughterhouses.

32. Detailed guidance should be produced by Government relating to design of unloading bays, as well as unloading points for farm trailers. This information should be widely distributed to all slaughter premises.

Inspection of animals

33. A number of consultees raised concern about the level of supervision at the unloading point in terms of dealing with any sick or injured animal. Although there is no requirement under WASK for slaughterhouse staff to supervise the unloading of vehicles, usually a member of staff will be in attendance. In some instances, this person will have undergone basic training in animal welfare. With the exception of those visits where the OVS formally joined the FAWC working group, the presence of an OVS or meat inspector supervising unloading was rarely apparent.

34. We support the principle of full supervision of the unloading process by the OVS. However, we recognise this may be impractical for all deliveries of livestock, especially those outside normal working hours. The slaughterhouse operator should be responsible in law for ensuring that unloading is supervised by a designated and competent member of staff at all times.

35. The OVS is required to notify the appropriate Divisional Veterinary Manager (DVM) about any animal welfare problems that may have occurred before arrival at the slaughterhouse. In addition, the Animal Health and Welfare Service of the Local Authority (often the Trading Standards Department) must be informed by the OVS where an offence may have occurred during transport. Local Authority officers are not designated as enforcement officers under the welfare at slaughter regulations but they are designated as enforcement officers for welfare during transport legislation. As a result, officers of the Local Authority would have access to the premises to look into transport related issues. They would also have access to hauliers and consignors' premises for any necessary follow up investigation.

Recommendations

36. A designated and competent member of staff, who has been trained in animal welfare, must be required by law to be present throughout unloading and his/her duties should be outlined in a code of practice.

37. The MHS must ensure its staff receives training and regular updating on legislation relating to welfare during transport and should encourage greater co-operation with Local Authorities on transport issues.

38. Local Authority enforcement officers should undertake regular checks on livestock transporters at slaughterhouses.

Isolation pens, procedures for casualty animals and emergency slaughter

39. Every slaughterhouse should have available an appropriate number of isolation pens situated near the unloading point where casualty or suspect animals can be held. We are concerned that, although the majority of premises provide isolation facilities, they are frequently not ready for immediate use. This is an unacceptable situation.

40. On occasions, animals are injured during transit and require emergency slaughter immediately on arrival at the slaughterhouse on welfare grounds. Procedures for emergency slaughter, and the telephone number of a duty slaughterman and other emergency contacts, should be clearly displayed at the unloading point.

41. Some animals are delivered to the slaughterhouse under casualty certification which, depending on their condition, may need to be dealt with differently from healthy livestock. We were satisfied with the procedures for dealing with casualty animals at slaughterhouses we visited. However, there are clearly difficulties if a casualty animal is received when no MHS staff are present. In such circumstances the overriding criterion must be to protect animal welfare. Where an animal is in obvious pain or distress it must be killed without delay rather than wait to undergo ante-mortem inspection.

Recommendations

42. The slaughterhouse operator must ensure that isolation pens are kept ready for their intended use.

43. The slaughterhouse operator must ensure that procedures for emergency slaughter, and the telephone number of an out of hours duty slaughterman and other emergency contacts, are clearly displayed at the unloading point so that any animal in obvious pain or distress on arrival at the slaughterhouse can be slaughtered or killed immediately.

Lairage

General

44. The lairage has various functions. As well as being a basic holding area for animals awaiting slaughter, it provides facilities for ante-mortem inspection and identification and is also somewhere animals can be rested. A number of slaughterhouses also use field lairages adjacent to the premises.

Time spent in the lairage

45. The time any animal, or group of animals, spends within the lairage varies greatly, both between slaughterhouses and between batches of animals within the same slaughterhouse. It may be less than an hour, overnight or, under the current Disease Control Order 2002, up to 48 hours. Research evidence suggests that an animal's ability

to properly rest in the lairage is limited since it can take several days for the animal to adjust to the new environment and resume normal patterns of behaviour. The time spent in the lairage may only make a limited contribution to recovery from the transport process.

46. Optimum lairage times, in terms of processing requirements, have been researched for pigs. They have not been studied in the same detail for most other species. In an attempt to achieve a balance between pigs having an empty gut and maintaining their energy reserves so that meat quality is unaffected, most pig slaughterhouses limit lairage time to between one and three hours. However, in welfare terms it is good practice to slaughter groups of beef bulls on arrival at the slaughterhouse since time spent in the lairage often results in added stress from competitive aggression. There is need for a review of the research in this area and work should be funded where there are gaps in our knowledge. Even when clear guidance on optimum lairage times is available, there will be circumstances when animals will be held for longer than anticipated. In these instances operators need to be aware that the needs of the animals, for space, water and feed will change over time. For example, although relatively tight stocking densities may be acceptable for a short period this would not be the case for animals held overnight.

Recommendation

47. Lairage times optimal for animal welfare, along with needs for water, feed and space over time, for each species should be included in Government's code of practice.

Lairage capacity

48. We are concerned that insufficient lairage capacity may result in animals having to wait on vehicles or lead to overstocking within the lairage itself. This is most acute in pig premises, seasonally for other species and in urban slaughterhouses where overflow capacity cannot easily be provided by a field lairage or additional buildings. The lairage area should be matched to the throughput of the slaughterhouse. For new premises, or those undergoing major refurbishment, plans have to be submitted for approval to the Food Standards Agency's Veterinary Public Health Operations Division before building starts. As part of this procedure the operators must indicate the species to be slaughtered and expected throughput. This process is primarily to check for compliance with the meat hygiene legislation. We consider that more emphasis should be placed on meeting animal welfare objectives.

49. Assessment of either new or existing premises should take into account the need for the capacity of the system to cope with incidents such as slaughter line breakdown or the requirement to hold wet animals until they are sufficiently dry for slaughter.

50. Many premises have gradually increased throughput over the years. There is no formal mechanism for ensuring that lairage capacity and handling facilities are sufficient to cope with this expansion. Although some operators do continually update their facilities to reflect the increasing scale of the business this is not always the case. We

believe there is merit in a full review of premises on a five year basis, or sooner if the slaughterhouse increases throughput substantially, in order to take animal welfare requirements into account.

Recommendations

51. The Food Standards Agency should ensure that the approval process for new premises, currently undertaken as a means of ensuring compliance with meat hygiene requirements, should include animal welfare objectives.

52. The Food Standards Agency should ensure that all slaughterhouses undergo a formal review of their structural approval every five years to ensure animal welfare assessments are met.

Lairage layout

53. Legislation requires that the place of slaughter or killing is sited so as to minimise the handling of the animal. During our visits we observed some slaughterhouses where the design might be called into question in this respect. The optimum outcome in terms of lairage layout is to be able to move animals from the unloading point to the holding pen and on to the point of slaughter as directly as possible. The number of turns and corners should be minimal and the route the animals take should encourage forward movement. For many premises, handling problems that arise as a result of poor design cannot be fully rectified without a major rebuild. However, more effort could be made to improve existing facilities. One-way gates, run-through lairage pens and elimination of right-angled corners in the system are just some of the possible solutions. Such small changes could have a significant effect in terms of worker safety, efficiency of handling and slaughterhouse throughput while at the same time markedly improving animal welfare.

54. When any new slaughterhouse is built the lairage layout must comply with the legal requirements. Although there are exceptions, it appears that many of those commissioned to build new slaughterhouses, although well experienced in the engineering aspects, may have limited knowledge of animal behaviour and handling.

Recommendations

55. When designing new slaughterhouses or re-designing existing ones, operators must ensure compliance with the legal requirement that the place of slaughter or killing should be sited so as to minimise the handling of the animal.

Lairage floors

56. The law requires that the floor surface should minimise the risk of slipping. This can cause a conflict of interest at slaughterhouse level, as the floor must also be easy to clean for meat hygiene reasons. In addition, when problems occur it can be difficult to

separate the effects of poor flooring, lairage design and animal handling practices. An animal rushed round a tight corner, even on a floor surface with good foothold is at risk of slipping. There seems to be wide interpretation on what constitutes a non-slip surface and in any lairage there are areas associated with a higher risk of slips or falls such as unloading bays, pen entrances and handling raceways.

57. Slaughterhouses may not be aware that any of their flooring is inadequate. The idea of scoring the number of slips and falls by animals at key points is a good practical method for both slaughterhouse operators and enforcement officers to make an objective assessment. Research in this area indicates that 1% of animals falling is unacceptable and that greater than 5% of animals falling or 15% of them slipping represents a serious problem. With some simple training in these techniques, enforcement officers and slaughterhouse operators would be able to prioritise those areas that require attention. A small investment in this area could lead to a substantial improvement in animal welfare.

58. We would support more research regarding the suitability of alternative floor surfaces in relation to both welfare and hygiene. However, there may be sufficient information already available that has not been widely distributed to, or applied by, the industry. For example, some slaughterhouses have experimented with novel surfaces and it would be useful if such knowledge could be formally evaluated and the results made available.

Recommendations

59. Government should issue guidance to slaughterhouses on suitable species-specific solutions for non-slip flooring. More evaluation is needed of new materials which might provide a non-slip but hygienic, easy clean surface.

60. Slaughterhouse operators and the MHS should implement a scoring system of animals' slips and falls as a means of regularly assessing floor conditions, design problems and standards of handling in their slaughterhouse (see Appendix D).

Noise in the lairage

61. The sources of noise in any lairage or handling area can be separated into that made by animals, by people and by machinery and equipment.

62. Pigs are vocal animals and it is not uncommon for waves of vocalisation to occur throughout the lairage, often with little clear cause. On the other hand, when pigs become distressed they can communicate this. Frequent, high and constant noise levels may be indicative of handling problems. Cattle will vocalise in response to an adverse event, such as goading, restraint, or falling and this is an indicator of the welfare of the animal during pre-slaughter handling. Vocalisation in cattle and pigs can be measured to give an objective assessment of levels of stress (see Appendix D). Some noise from animals is inevitable but vocalisation as a result of an adverse event can only be solved by addressing the root cause.

63. Separation of the lairage from the pre-slaughter handling area either by space or a soundproof wall or partition reduces the effect of animal noise on animals in the lairage, particularly in the case of pigs.

64. Animals will often react adversely to the noise and movement of people and this should be kept a minimum.

65. Noise from equipment and machinery is under the direct control of the operators. A greater attempt must be made to dampen sources of noise or make use of more suitable materials so as to reduce noise levels. Particular attention should be given to gates and a 'non slam' culture should be developed. Other sources of noise such as air lines and compressors can be reduced or eliminated by correct maintenance. Maximum noise levels and exposure limits should be set for animals as for operators. This should be included in guidance for slaughterhouse operators with practical steps for baffling or reducing noise.

66. There may be other sources of sound from machinery and equipment that are not apparent to humans but disturbing to the animal. We would support a review of current knowledge on the effect of sound on livestock and the impact on animal welfare.

Recommendations

67. The slaughterhouse operator should monitor levels of vocalisation within the handling system and, where they are beyond acceptable limits, should identify the cause of the problem and rectify it (see Appendix D).

68. Government should fund research on noise in slaughterhouses and its effects on the welfare of livestock. This should lead to maximum noise levels and exposure limits being set for animals. This should be supported by guidance from Government for slaughterhouse operators on practical steps to baffle or reduce noise.

Ventilation in the lairage

69. It is a legal requirement that lairages should be ventilated to ensure temperature, humidity and ammonia levels are kept within limits that are not harmful to the animals. There is limited evidence to show that operators monitor these criteria or are clear what the harmful limits might be. Older slaughterhouses in particular may give rise to concern if buildings are not well designed in terms of ventilation.

70. All premises would benefit from a regular assessment of lairage ventilation. This is particularly important for those premises where a major rebuild is unlikely in the foreseeable future. More detailed advice is needed for both enforcement officers and slaughterhouse managers on the harmful effects of inadequate ventilation. Clear parameters on what constitutes harmful limits in terms of temperature, humidity and ammonia need to be specified.

Recommendation

71. Government should provide specialist advice on lairage ventilation. In addition, there should be clear guidance on limits for temperature, ammonia concentration and humidity for slaughterhouse lairages.

Provision of feed and water in the lairage

72. There are growing concerns that increased transport and marketing times could lead animals to go for long periods without feed or water. The conditions under which animals need to be fed and watered are laid down for each component of the process (transport, market, and slaughter) but no account is taken of the cumulative effects. Legislation and guidance must take account of the fact that animals may undergo a period of transport and possibly time in a market or collection centre before they are slaughtered.

73. There was a call from both industry and welfare bodies alike for provision of guidance on feeding and watering of slaughter livestock. No two journeys are identical and there is a delicate balance to be struck in terms of the welfare needs of the animal and the requirement of the slaughterhouse. We believe there is a body of information already in existence which if collated could be of use in developing optimum schedules for feeding and watering of livestock. More use could be made of transport documentation in this context.

74. The law states that water must be 'available' to all animals at all times. It is our experience that there is a broad interpretation of 'available' as a result of which animal welfare may sometimes be compromised. In practice, water availability may be restricted through overstocking, insufficient watering points, contamination or if the drinking facility is not suitable for the species. This is as applicable to field lairages as it is to covered lairages.

75. Our observations were that cattle and sheep pens had fewer watering points than those for pigs, often one bowl per pen. When stocking rates were high, this limited the access individuals had to water. In addition, there may be higher demands for water from certain groups of animals depending on their diet at source, journey time and the climatic conditions. We recommend that operators be reminded of the legal requirement to make water available to all animals in the lairage and support the provision of more guidance to enforcement officers and operators on those factors that affect the animals' needs and water availability.

Recommendations

76. Government should provide advice on optimum schedules for feeding and watering prior to slaughter, taking into account the travelling and marketing time animals may have undergone.

77. The MHS should remind slaughterhouse operators of the legal requirement to make water available to all animals at all times in the lairage and must ensure that this is enforced.

Space allowance in the lairage

78. Animals are required to have sufficient space to stand up, lie down and turn around without difficulty when penned. There was considerable concern amongst those consulted that animals are often penned so tightly in lairages that these basic requirements are not met. There is a need for guidance setting down minimum permitted space allowances. There is no research that specifically relates to the optimum space allowances within a slaughterhouse and thus slaughterhouse operators and enforcement officers rely on figures taken from a wide variety of sources, including transport guidance and the welfare codes of recommendations. The problem is compounded by the need to avoid mixing some groups of animals, the wide variation in journey time to the slaughterhouse and animals being penned for anything from an hour to overnight. A small space allowance for a short period of time may be acceptable but while animals are held overnight and/or after long periods of marketing and transport, they need more space. Whilst research data is inadequate we welcome the steps that some operators have taken to issue guidance to staff on minimum space allowances from short term to overnight lairaging by posting minimum space allowances on the pens.

Recommendation

79. Government should issue guidance on minimum space allowances based on existing knowledge. These should be published as a matter of urgency. Research should be conducted to establish optimum stocking densities for all species applied across a range of circumstances.

Mixing of livestock in the lairage

80. Mixing unfamiliar groups of pigs in the lairage will result in aggression, stress and meat quality problems. Group size should be limited and animals kept in farm groups all the way through the transport, marketing and slaughter process. Research on cattle also demonstrates that mixing animals can lead to a greater incidence of aggression, although in practice cattle are more likely to be mixed both on the lorry and at the lairage. Bulls in particular should not be mixed. Mixing of sheep appears to be less of a welfare issue. Research indicates that aggressive behaviour occurs between sheep from the same original group rather than between animals that are newly mixed.

81. When considering the building of a new lairage, or upgrading existing facilities, penning should be as flexible as possible in order to allow subdivision and therefore avoid mixing unfamiliar groups of cattle or pigs.

Recommendations

82. Government should issue guidance to operators on the effects of mixing of livestock in slaughterhouses.

83. Slaughterhouse operators should ensure that their lairage design reflects the need to avoid mixing unfamiliar groups of either cattle or pigs.

Showering pigs

84. The majority of specialist pig slaughterhouses provide showering or misting facilities. This has a number of functions, which include cooling the animals and reducing aggression. Intermittent showering in hot lairages may be beneficial. Continuous showering, however, does not allow pigs to rest. Showering in humid conditions or within poorly ventilated buildings may increase the stress on pigs. In cold weather the use of sprays may chill pigs excessively. Showering should cease immediately if animals are seen to be shivering. Clear guidance is required on showering regimes for pigs**.**

Recommendation

85. Government should issue guidance on showering regimes for pigs in slaughterhouse lairages in its code of practice.

Field lairages

86. The legislation protecting the welfare of animals at slaughter applies within the curtilage of the slaughterhouse. Whether or not field lairages are regarded as being within the curtilage seems to vary from plant to plant. Although in some cases both operators and MHS staff treat these areas as part of the premises, many clearly do not and this requires clarification. We consider that field lairages abutting (or contiguous to) the slaughterhouse premises can be considered within the curtilage.

87. During the course of our visits we were concerned about the management and condition of some of these facilities. However, where well managed, we see the potential for animal welfare benefits from the use of field lairages, particularly in terms of stocking density and for animals unused to confinement.

88. The unloading point is an ideal opportunity for assessing the fitness of the animals and the quality of the previous handling and transport. Unloading animals straight into a field lairage without them being seen by the OVS and later bringing them from there into the covered lairage may present a number of risks to animal welfare. Unloading to field lairages should be supervised by slaughterhouse staff, and ideally by the OVS, in order to identify any sick or injured animals that may need to be dealt with promptly. A record should show numbers, arrival time and date. Guidance for field lairages should take into

account the risk of disease build-up as well as the physical condition and quality of the pasture.

Recommendations

89. Government must ensure that field lairages contiguous to slaughterhouses are defined as being within the curtilage of the premises.

90. Government should issue guidance on the proper management of field lairages to prevent the risk of disease build up, preserve good conditions underfoot and maintain adequate pasture.

Handling of animals prior to stunning

General

91. Until recently, handling procedures in the slaughterhouse would have been confined to unloading from the vehicle to a lairage and from there to the stunning point. However, with cattle and sheep there are now additional handling events such as checking the animals' age and identification, and possibly remedial treatments to comply with the clean livestock policy. We cover these later in this section of our report. From a welfare standpoint, animals should be handled as little as possible; handlers should be competent and the systems used should be designed to encourage the smooth movement of stock.

Design of pre-slaughter handling systems

92. There has been a great deal of information published on design of pre-slaughter handling systems. Although much of this information stems from countries that handle animals on a large scale, such as the US and Australia, work relevant to Great Britain has been carried out for both pigs and cattle. The principles of good design are well established and many of these ideas have been incorporated into previous MAFF Codes of Practice for the design and construction of slaughter premises.

93. During the course of our visits we saw a broad range of handling facilities. Some slaughterhouses had spent time and effort in designing a workable, 'animal friendly' system. However, many of the systems we saw were either outdated or had overlooked one or more key animal handling principles. To overcome such deficiencies in design, animals frequently had to be goaded or otherwise forced to move forward. Despite advances in research and the provision of advice, many ideas that can improve design have not been widely adopted. There may be several reasons for this:

- Lack of finance – lairage and handling facilities are usually last to attract investment;
- Lack of space or limitations within existing buildings or the site as a whole - rarely is there a chance to build on a completely new and unfettered site. Although the solution may seem straightforward, closer examination may reveal practical difficulties leading to a compromise which falls short of the animal welfare ideal; and

- Time and expertise – the redesign of any system is a slow process and demands a full appraisal of the existing facility to highlight the good and the bad. All too often changes are made without any objective evaluation, resulting in a facility not positively designed for the purpose but rather evolving over the years.

94. There is much to be learned by watching the slaughter operation over a period of time. This allows appreciation of how the system works in terms of both the type and throughput of animals that are being handled and the number and skills of the workforce. Once this assessment has been made then changes should be made, a step at a time, to ensure their effectiveness. Techniques have been developed in the USA and used in research in Great Britain where measurement of certain behaviours, such as slips, falls, stops, turns, vocalisation and the use of goads can be used as indicators of animal welfare problems within handling systems. The methods are relatively simple to apply and could be used by industry to help evaluate and improve facilities (see Appendix D). Design cannot be dictated in law, as each slaughterhouse is different and will be faced with a different set of problems needing different solutions. Improvement will only be made by strengthening the advice and information given by Government to slaughterhouse operators and to management, enforcement officers and slaughterhouse engineers.

Recommendation

95. Government and the industry should establish a design resource based on the best available data from research and practice, for animal handling systems from unloading up to the point of slaughter (see Paragraphs 119 and 138)

Handling for identification

96. Since the introduction of cattle passports in 1996 all cattle must be checked at the slaughterhouse to ensure the passport corresponds with the animal's ear tags. At present the majority of animals are handled through a crush and tags are read manually, which may require the head to be restrained. Mouths of cattle and sheep may also need to be inspected to ensure they are less than 30 and 12 months of age respectively. These additional procedures, necessary for either IACS compliance, food safety or animal health and traceability objectives, constitute additional stresses on the animal and sometimes result in reluctance to enter the stunning box. We have been satisfied with the crushes we have seen and their operation. Individual identification of sheep could become a requirement and identification for all pigs may follow. The reading of identification represents a major handling issue. We believe that a workable electronic identification system is the ideal solution for traceability, the consequent identification requirements and should reduce pre-slaughter handling.

Recommendation

97. Government should ensure that any future introduction to Great Britain of methods of animal identification take account of the welfare implications of animal handling in slaughterhouses.

Handling to fulfil the requirements of the clean livestock policy

98. The clean livestock policy was introduced by the MHS in 1997 to tackle the problem of dirty animals being delivered to the slaughterhouse. The OVS can request that an animal be cleaned before being re-presented for ante-mortem inspection. As a result, slaughterhouses may clip or wash animals on the premises (and charge the producer for the service). In the year ending June 2001 approximately 30% (1,897) of cattle and 43% (69,186) of sheep that were rejected were subsequently cleaned.

99. Concern has been expressed about the suitability of facilities in the slaughterhouse and the expertise and availability of staff to carry out these cleaning and clipping procedures, as well as the actual procedures themselves. Clipping of sheep should require no more than a small holding pen and a clear area for the shearer. Clipping out the legs and bellies of soiled cattle requires suitably designed crush facilities to reduce the risk of injury to both cattle and staff. The process is likely to be stressful to the animal in terms of the restraint required and the clipping process itself. It is vital that staff undertaking the cleaning of animals are competent in handling stock, clipping and the care and maintenance of equipment.

100. Dirty animals can be washed and then penned to dry but pressure washing has potential for abuse. Sensible guidelines on the use of pressure washers on livestock include:

- Pressure washers should be set at the absolute minimum pressure required for cleaning livestock;
- Care must be taken to ensure that the spray is not directed towards sensitive areas, such as the eyes and ears;
- The temperature of the spray should not be aversively warm or cold; and
- If any animal shows obvious signs of distress or requires unreasonable levels of restraint, pressure washing should cease immediately.

101. The need to routinely clean animals at the slaughterhouse presents a welfare issue in itself and should not be classed as normal. Livestock should be presented clean for slaughter and producers should be reminded of their responsibilities in this area. The incidence of cleaning livestock in the slaughterhouse should be monitored by the OVS and where there is continued presentation of dirty animals by a producer this should be followed up through the SVS.

Recommendations

102. Slaughterhouse operators should actively discourage presentation of dirty livestock for slaughter and should not see the provision of a routine cleaning service as part of their operation. If a producer persistently presents dirty animals for slaughter the OVS should instigate an investigation through the SVS.

103. Government should issue guidance to slaughterhouse operators and enforcement officers with regard to acceptable equipment and procedures for cleaning of animals.

104. Where clipping and shearing has to be carried out at the slaughterhouse, facilities should be suitable for the purpose and the procedure carried out by trained, competent operators.

105. Where washing has to be undertaken at the slaughterhouse we recommend that water pressure and temperature limits are set and if any animal shows obvious signs of distress or requires unreasonable levels of restraint, pressure washing should cease immediately.

Handling aids and goads

106. There are a wide variety of devices available to assist with and encourage the forward movement of livestock. Benign handling devices such as flags, flappers, bags and pig boards were used in many of the premises visited, to varying effect. We welcome the trend in this direction; however it is important that handlers do not become overzealous in their application of these devices to the point where they may cause harm, or use them inappropriately.

107. Although many slaughterhouses operate without electric goads, we were witness to the inappropriate and habitual use of electric goads both as a result of high throughput, poor system design and/or lack of thought on the part of the animal handler. Electric goads should only be used in exceptional circumstances. We consider they should be kept near at hand, but not continually held by the drover to prevent their habitual but unnecessary use. Where slaughterhouse staff resort to the use of electric goads simply to get animals through the handling system, action must be taken to improve the design of the system. Habitual, excessive use of goads also demonstrates the need for a wider range of enforcement options for the OVS, such as stopping the line if corrective action is not forthcoming by issuing an improvement notice (see paragraphs 295-297). The use of goads can be monitored by slaughterhouse operators as a measure of welfare (see Appendix D).

Recommendations

108. Electric goads should only be used in exceptional circumstances and only when human safety may otherwise be compromised.

109. The slaughterhouse operator should monitor levels of goading within the handling system and, where they are beyond acceptable limits, should identify the cause of the problem and rectify it (see Appendix D).

Horned cattle

110. There are a noticeable number of horned cattle presented for slaughter and slaughterhouse staff expressed concern about this trend. Where groups of horned and polled animals are being handled in the slaughterhouse there is a greater risk of the horned animals injuring others, particularly at unloading and along raceways and passageways. The presence of horns can cause problems in restraint of the animal for identification or, more importantly, for stunning. There is evidence to demonstrate that bruising is more prevalent where horned cattle are present and that, during handling procedures, horns can cause serious injuries to other animals.

111. FAWC recognises that de-horning of cattle is a welfare challenge in itself and believes that it would be preferable for calves to be disbudded. We further believe that recently dehorned cattle with unhealed wounds should not be presented for slaughter.

112. Horned cattle should not be acceptable in slaughterhouses. Council believes that a realistic lead in time for this requirement is three years. Specialised breeds of cattle where horns are integral to the breed should be considered for exemption and specific arrangements should be made for their handling and slaughter.

Recommendation

113. FAWC believes that horned cattle, or recently dehorned cattle with unhealed wounds, must not be presented for slaughter, with the exception of defined specialised breeds for which specific arrangements should be made.

Handling of cattle before stunning

114. Cattle should not be allowed to enter the stunning box unless staff are ready to stun and slaughter immediately. We were concerned about the time some animals spent in the raceway prior to stunning; exceptionally at one slaughterhouse it was some 45 minutes and as a result the animals showed clear signs of agitation. Animals should be kept with others for as long as possible and time spent in the race kept to a minimum.

115. Many stunning boxes have design faults that contribute to levels of distress. Although stepped or sloped floor surfaces are there to assist with roll-out, they may cause animals to panic. Floors within the stunning box should be level with no obstructions or steps. Animals with even the smallest step to contend with constantly step up and down off it. It is our view that suitable designs of box with level floors do exist which ensure that the animal rolls out. Distractions such as light, noise, air currents and plastic curtains, both at the point of entry and within the box itself, may hinder animals entering the box and interfere with restraint of the head or the stunning process itself. There are

sufficient examples of good design available but these are not well communicated to those operating faulty designs and thus simple faults are not corrected. Poor design results in resorting to the use of goads, addressing the symptom rather than the cause.

116. Legislation requires that stunning boxes be fitted with some device that restricts the movement of the animal's head, although it is not a requirement for it to be used on every occasion. Research has been carried out on the welfare aspects of various types of restraint and this advice has been communicated to both the industry and the MHS. In general we were satisfied with the restraint devices we saw. However, some premises still have no devices fitted. This is a clear breach of the legislation and although we support the view that restraint may not be desirable in every case it will be required on some occasions, not least for new staff.

117. Tail or rump pushers within the stunning box, sympathetically used, are helpful in positioning the animal to restrain the head to limit the forwards and backwards movement of the animal and to cope with smaller cattle. Few of the boxes in use were fitted with such devices and although not a requirement in law we would encourage their use.

Recommendations

118. Slaughterhouse operators must ensure that cattle are not allowed to enter the handling system unless staff are ready to stun and slaughter immediately.

119. Guidance should be given in the design resource to be established by Government and the industry on the design of stunning boxes (see Paragraphs 95 and 138)

120. All stunning boxes should have a level floor; all new installations with immediate effect and all boxes by 2008.

121. Legislation that requires stunning boxes to be fitted with some device that restricts the movement of the animal's head must be enforced by the MHS.

Handling and restraint of sheep and pigs before stunning

Group stunning pens

122. Group stunning pens are in use for sheep, pigs, calves and goats where animals are to be stunned with either a captive-bolt or head only electrical methods. There are no specific legislative guidelines on their design, construction or use. This type of pen is common in small to medium sized slaughterhouses and has changed very little in design for many years. However, there are some larger operations, particularly pig processing plants, which operate with this system.

123. Groups of animals are brought from the lairage and into the pen. Group size will vary from slaughterhouse to slaughterhouse. Movement of animals to the stunning pen is relatively straightforward and requires little in the way of coercion provided there is

reasonable access from the lairage area. Electric goads are not needed nor should they be used in these systems.

124. Animals are not physically restrained and move around the pen until they are in a position to be stunned. In the majority of systems the pen is filled and all animals stunned before the pen is filled again. If the pen is too full at the beginning it may be difficult for operators to move freely, or position the stunning equipment accurately (with the risk of accidental pre-stun shocks with head only electrical equipment) and there may be difficulties in shackling animals quickly. If operators do not work quietly, animals in close confinement may crowd one another.

125. The effectiveness of pig movements into group stunning pens is affected by a number of problem areas; group size, turns at the entry to the pen, slippery floor surfaces and stun pen dimensions. To get pigs to move freely the stun-pen should lead straight on from the passageway. The group size should be relative to the size of the pen; an allowance of 1.2m² per pig has been recommended to us. Similar assessments have not yet been carried out for other species.

Recommendations

126. Government should include criteria for the design and operation of group stunning pens for pigs in its code of practice.

127. Government should fund research to evaluate optimum criteria for design of group stunning pens for sheep, calves and goats.

Restrainer/conveyors

128. Larger, specialist pig and sheep plants with high throughputs may use automated equipment to move and restrain animals for stunning. Automated restrainer/conveyers for cattle have been developed in the USA but are not yet in use in Great Britain. Most of these restrainer/conveyors support the animals either between two v-shaped moving belts or along the length of the belly. Some systems also incorporate stunning equipment and are fully automatic. Alternatively the animal is stunned manually at the exit from the restrainer with captive-bolt, electrical head-only or head-to-body equipment. Such restraint systems allow for accurate stunning but may cause stress to the animal both in terms of loading into the restraint device and the effects of the restraint itself.

129. Design of the pre-stun race is important. For optimum effectiveness, the speed at which the animals enter the restrainer, the restrainer speed and the stunning speed should be the same or very close. Delivering animals to feed the restrainer at a rate quicker than the restrainer can move them forward leads to animals stopping, especially with pigs.

130. A high level of goading required at the restrainer entrance is an indicator of a design or operational problem. At the point of entry into the restrainer, animals may refuse to go forward as they detect that the floor is falling away (creating a visual cliff

effect). There is sufficient information available to resolve the situation. The use of electrical goads must not be considered as a routine requirement of the system.

131. Where animals must be restrained, the least stressful methods are those where the animal is firmly held. With their feet off the floor animals are less likely to attempt to struggle and be injured. Restrainers which support the animal on the chest have been shown to be less stressful for pigs and cattle than "V" shaped restrainers and the former are in use in some plants in the UK.

132. The time spent in the restrainer, provided the system is operating correctly, should be relatively short. Distress is more likely to occur when the animal is held for long periods of time or because the system cannot accommodate the very large or very small animal. Where restraint equipment is used, correct maintenance, set-up and operation are all important to minimise injury or distress. Animals must never be left waiting in restrainers. There must be emergency stop controls within easy reach of both the stunning operator and the animal handlers. There should also be a process by which the system can be evacuated or, alternatively, for animals to be killed in situ.

Recommendations

133. The use of goads should not be considered a routine requirement of any pre-slaughter handling system.

134. Animals must never be left waiting in restrainers. In the event of a breakdown they should be able to be evacuated or killed in situ.

Pre-slaughter handling of pigs in gas killing systems

135. Gas stunning methods which allow pigs to be handled and stunned in groups are arguably better in terms of reducing pre-slaughter handling stress. In Great Britain, pigs are generally moved from a crowding pen into an enclosed race system. They are then encouraged to enter the cradle of the gas unit.

136. Carbon dioxide systems for pigs consist of a number of cradles on a carousel system, which then lowers the pigs into the gas. The effectiveness of the loading procedure is important not only for the pigs currently being loaded but also for those animals in the previous cradle. Any hold ups loading the cradles will result in delays in moving pigs into the gas. In older systems each cradle holds up to three pigs and the cradle is loaded through one end. The entrance is restricted in width and although single pigs can be loaded with relatively little coercion there is insufficient time and space to consistently load groups of two or three pigs without resorting to the use of goads. The higher the line speed the greater the problems become. Despite recent research and the publication of guidance on ways to improve handling into these systems, the level of coercion required in some slaughterhouses to move pigs is unacceptable and stricter enforcement is required. A ban on the use of electric goads in these circumstances might

stimulate operators to take a more serious approach to the design of their handling systems.

137. Danish researchers have developed a handling system where a group of pigs (3-5) is loaded through the side of the cradle by means of a slow moving, automated push gate. We were impressed that this design eliminated the need for electric goads, or indeed any form of handling aid.

Recommendations

138. The design resource already recommended should include handling systems that allow groups of pigs to calmly enter gas killing systems (see Paragraphs 95 and 119)

139. Electric goads should not be used in any gas stunning/killing handling systems.

Stunning and killing

General

140. The animal welfare legislation prescribes the permitted methods of stunning and/or killing and lays down specific requirements with regard to their operation. The choice of stunning or killing method employed by any slaughterhouse will depend on a number of factors including the species, throughput, cost, operator ability and safety, versatility and carcase quality.

System of approval for stunning/killing equipment

141. In the animal welfare slaughter legislation, the onus is on the operator of the slaughterhouse to ensure that instruments or equipment for stunning and killing are appropriately designed, constructed and maintained. Any equipment used for stunning or killing must be suitable for the purpose and be capable of performing to a required minimum standard. There is no mechanism for equipment approval or a system that gives purchasers the assurance that properly installed and operated equipment is capable of producing the required stun or kill. The enforcement officer in each slaughterhouse is left to make an assessment once the equipment has been installed. With equipment becoming more sophisticated, and in the light of new research, many have advocated that all stunning or killing devices should be subject to an independent scrutiny before widespread introduction into the industry. Equipment which passed set criteria would be 'approved' and form the basis of a recommended list. The approval system could be extended to cover items such as electric goads, with specification as to their electrical characteristics.

142. This approach has a number of advantages. For any new equipment installed by the slaughterhouse management, the slaughter team and the enforcement officer would need to know that it was up to the required standard. As knowledge and technology advances, equipment could be withdrawn from the list as being no longer suitable for use.

Manufacturers would have a greater incentive to continually improve and develop products without the threat of being undercut by outdated equipment.

Recommendation

143. Government should establish a mandatory system of approval for stunning/killing equipment to ensure suitability for the purpose intended.

Maintenance of equipment

144. The law requires that all equipment should be properly maintained. The ability of enforcers to operate a system of improvement notices that would formally prevent poorly maintained equipment being used would help to ensure that equipment is adequately serviced (see paragraphs 295-297).

145. A number of slaughterhouses keep maintenance records as part of their own quality assurance or control systems. This practice should be encouraged through any code of practice. However, it is important that the emphasis remains with checking on the equipment itself rather than the record. The maintenance schedule should be relevant to the operation of the equipment.

Recommendation

146. The OVS should monitor the keeping of records of slaughter equipment maintenance.

Monitoring of stunning

147. Most operators rely on the OVS to monitor the stunning operation. Although we are aware of monitoring arrangements on some stunning/killing systems, the practice of routine objective assessments is not common. In all but the very smallest operation, spot checks and recording of operator performance has much to recommend it. Other initiatives such as installation of video cameras in the stunning area or objective measurement of the stunning position are also welcome and should be pursued.

148. Devices are also available, or are being developed, for monitoring the performance of slaughter equipment. We would strongly support more widespread use of such monitoring devices by slaughterhouse operators and by enforcement staff.

Recommendations

149. Monitoring by slaughterhouse operators of the stunning/killing procedure should be audited by the OVS.

150. The use and continued development of devices to monitor stunning equipment should be pursued by Government and industry organisations.

Back-up systems

151. Suitable spare equipment must by law, be kept for use in an emergency at the site where stunning or killing takes place. In practice the back-up equipment in the slaughterhouse is often not to hand. There is a need to enforce the law more rigorously. In bigger slaughterhouses where the lairage may be some distance from the slaughter line, spare equipment should also be held in the lairage area to deal quickly with animals in pain or suffering. It is important that back-up systems are regularly well maintained.

Recommendations

152. Whenever the slaughterhouse is operating, the OVS must rigorously enforce the requirement that back-up stunning or killing equipment must be ready for use at the point of stunning or killing.

153. In larger premises where the lairage is separated from the slaughter line, slaughterhouse operators should ensure that back-up killing equipment is kept in the lairage area to deal quickly with animals in pain or suffering.

Gas stunning/killing of pigs

154. The killing of pigs by exposure to carbon dioxide is permitted under the current EU Directives and Great Britain legislation. Although used in a relatively small number of premises, about one third of all pigs killed in Great Britain are killed by this method.

155. FAWC considers that the following general principles should apply in all gas stunning and killing operations:

- pigs should be maintained in a stable social group with the minimum of restraint;
- pre-slaughter handling facilities should be designed to minimise stress;
- the gas used to induce unconsciousness should not be aversive;
- all pigs should be rendered rapidly unconscious in the gas;
- an irreversible state of unconsciousness (death) must be reached in all pigs prior to sticking; and
- there should be adequate monitoring of the system and efficient evacuation in the event of any system failure.

Carbon dioxide and alternative gas mixtures

156. In recent years there has been considerable research work undertaken both in Great Britain and other countries, including Sweden, Denmark and Holland, on the welfare aspects of carbon dioxide stunning of pigs and the relative merits of alternatives to CO_2 for commercial use.

157. Conclusions from several research authorities indicate that when pigs are introduced into 80% or higher concentrations of CO_2 there is a period of about 10 seconds when there is little behavioural reaction. There then follows a period of breathlessness and hyperventilation for a further 10 seconds, and at this point there may be vocalisation and escape behaviour. These signs are followed by loss of posture and onset of convulsions. Based on observed behaviours and measures of brain activity there is a considerable period of time, up to 15 seconds, before the pig loses consciousness. On the basis of both the results of this research and from our own observations the effect on individual pigs seems to vary from mild to severe aversion.

158. FAWC supports further research into and development of alternatives to CO_2, such as mixtures including argon or nitrogen, which are less aversive. Argon, in high concentrations, has been shown to cause anoxia with no noticeable aversive effect. However, the research evidence shows that a potential difficulty with the use of argon for stunning pigs is the exposure time required to ensure insensibility until death supervenes. Exposure to argon for 5 minutes or less can result in rapid recovery. Unless pigs can be immersed in the gas mixture for periods of 7 minutes or longer, additional steps need to be taken to ensure death by cardiac arrest or bleeding. It is therefore not possible to simply replace the CO_2 gas mixtures used in the current systems with other gas mixtures. Development work is required to produce a new system for use with argon, nitrogen or other non-aversive gas mixtures. FAWC does not see the achievement of engineering solutions as an insurmountable problem.

159. We conclude that the use of high concentrations of CO_2 to stun and kill pigs is not acceptable and we wish to see it phased out in five years.

Recommendation

160. Government and the industry should fund research and development into the use of non-aversive gas mixtures. The use of aversive gas mixtures should be phased out within five years.

Captive-bolt stunning

161. Aside from our concerns about stunning box design and the requirement for monitoring the system, we are satisfied that penetrative captive-bolt stunning is effective. Newer equipment on the market is a significant improvement on the models produced some 20 years ago, to the point where a well maintained stunner even slightly off the ideal position is still capable of producing an effective stun. Guidance is available on all aspects of captive-bolt operation through Humane Slaughter Association (HSA) publications and via training on Animal Welfare Officer courses.

162. Concerns have been raised about the use of captive-bolt stunners in the light of nvCJD. The captive-bolt stunner is effective, versatile, portable and safe to use compared to a free bullet. The potential loss of this tool without a suitable substitute would present a major animal welfare challenge.

Electrical stunning/killing

Head only electrical stunning

163. Head only electrical stunning systems are mainly in use for sheep and pigs. The animals are either confined within a group stunning pen or restrained in individual or conveyor restrainers. With hand held equipment a successful stun is heavily dependent on the skill of the operator to position the electrodes accurately and the delivery of sufficient current to render the animal unconscious.

Tong position

164. Survey work conducted by Bristol University after FAWC's previous slaughter report indicated serious deficiencies in the accuracy of tong positioning with the associated risks of ineffective stunning. Achieving a high level of accuracy at each application is essential. We would recommend close monitoring by the OVS and slaughterhouse managers with swift action being taken if performance falls below acceptable levels (see Appendix D).

165. The design of the tongs and the layout of the stunning pens can have a significant impact on the ability of the slaughterman to stun effectively. Operators must address the issues relating to the design of the pen and the numbers of animals being handled. Advice on pigs is now available but similar research is required for sheep, goats and calves.

166. Work has been commissioned by Government on the design of more suitable electrodes to improve both application and current flow. Results of this work need to be transferred to the industry as soon as they are available and rapidly implemented thereafter.

Recommendation

167. Tong positioning and effectiveness of stun should be monitored by the OVS and slaughterhouse managers with action being taken if performance falls below acceptable levels.

Equipment specifications

168. Minimum current levels have been published in previous MAFF Codes of Practice; however, there is still some confusion regarding the parameters that are required to produce an 'adequate' stun. This has led to a call for minimum stunning currents to be regulated. Although there are advantages in this approach there is a danger that being prescriptive will neither allow nor encourage the development of new technologies, e.g. the use of different waveforms or frequencies. We would recommend that clear species-specific guidelines on current and stun time be laid down in a code of practice.

169. Whereas electrical parameters are well researched for finished pigs (and sheep) there is a need for similar evaluations for sows and boars. Where it is evident that existing equipment is inadequate for stunning large sows and boars its use should be discontinued.

Recommendation

170. Government should produce clear species-specific guidance on currents and application times for electrical stunning.

Failsafe systems

171. Current legislation requires that all electrical stunning equipment be fitted with a failsafe device that prevents current flowing unless it is sufficient to provide an effective stun. Despite lengthy research it does not appear possible to develop the equipment that can deliver the necessary assurances in this respect. Therefore, equipment in use is not in compliance with the current legislation.

Electrical stunning/killing systems for cattle

172. A small number of electrical stunning/killing systems for cattle have been installed in Great Britain relatively recently. At present a fairly small percentage of cattle are killed by this method.

173. The system works by applying a current across the head to stun the animal, followed by application of electrodes to the brisket which stop the heart. Once the animal has entered the stunning box, the sequence of head restraint and application of electrodes can be automated. In order to limit reflex movement and the risk of injury to operators subsequently handling the carcase there is a process of spinal depolarisation before the animal is ejected from the stunning crate.

174. This system has animal welfare benefits in that it produces a kill rather than a stun and is not so heavily reliant on the individual skill of the operator. The potential risks of the system are the stress associated with the box itself along with restraint and failure of the application or timing of equipment. The equipment is technically complex and needs to be maintained and monitored by competent technicians. We were made aware that build up of dirt on the electrodes and dirty animals affected performance. The system requires both clean cattle to be presented and the electrodes to be cleaned frequently during the course of the day's work.

175. The application of spinal depolarisation has led to a lack of confidence that the animal has been effectively stunned and killed. There is a need for guidelines on recognising effective stun/kill or indications that the system is not operating to the specified sequence. We are concerned that the equipment we saw in use had nothing to indicate the currents applied or under load. Given the level of technology involved it

would seem appropriate that such equipment would come complete with inbuilt monitoring/recording facilities. This further illustrates the need for equipment testing and approval.

176. FAWC is of the opinion that head only electrical stunning for cattle can only be sanctioned if animals are effectively bled within the required time frame (approximately 15-20 seconds). In practice this may require bleeding on a horizontal table immediately on discharge from the box. Any delay in bleeding will result in animals recovering.

Recommendations

177. Electrical stunning/killing systems for cattle must be closely monitored and maintained by the slaughterhouse operator to ensure effective stunning/killing.

178. Government should produce guidance for slaughterhouse operators on recognising an effective stun/kill when using electrical equipment on cattle.

Slaughter

Slaughter without pre-stunning

Background

179. The Welfare of Animals (Slaughter or Killing) Regulations 1995 (as amended) (WASK) require that all animals are stunned before slaughter, using the methods of stunning prescribed by the Regulations, subject to specific exemptions. One of these exemptions refers to slaughter without the infliction of unnecessary suffering by the Jewish method for the food of Jews; or by the Muslim method for the food of Muslims, provided the requirements for the licensing of slaughtermen under the Regulations are met. Religious issues surrounding slaughter without pre-stunning were explored in detail in the FAWC report on religious slaughter published in 1985 and have not been re-iterated in this report. Council has taken account of relevant information generated since then in drawing its conclusions. We welcome the implementation of those recommendations that were accepted at the time but feel that the outstanding welfare issues should be re-examined.

180. The Jewish method of slaughtering animals for food (Shechita) requires that they be healthy at the time of slaughter and must not have suffered any physical injury. For this reason, pre-slaughter stunning methods that are judged to cause physical injuries prior to cutting the throat have been considered unacceptable for this slaughter method.

181. Cattle are restrained in an upright position in a specialised pen with the head held fast and the neck exposed in a suitable position for incision of the throat. A transverse cut must be made using a reciprocal, uninterrupted motion of the knife. The intention is to produce an immediate outpouring of blood by severing both jugular veins and both carotid arteries. The knife used for cattle has a long, extremely sharp and undamaged

blade. After the cut has been made the animal must remain restrained until it is bled out before being released, shackled and hoisted. With Rabbinical approval some premises have adopted a post-cut stun for cattle.

182. In the case of sheep, the animal may be shorn around the neck prior to slaughter to ensure that the knife is not blunted by the wool, or the incision contaminated. Sheep are manually placed on their back on a cradle. The handler will hold the animal on the cradle whilst the neck is extended and a transverse incision is made, in much the same way as for cattle, resulting in an immediate outpouring of blood. The sheep must remain on the cradle until it has bled out before it is shackled and hoisted. No post-cut stunning is carried out in sheep.

183. During our consultations concern was expressed to us about meat from animals slaughtered without pre-stunning (including meat from the hindquarters of some animals and meat from rejected animals) being placed, unidentified, on the open market rather than being consumed by the Jewish community. As a result, larger numbers of animals are slaughtered without pre-stunning than would be necessary if all carcases, and the entire carcase were acceptable. FAWC will return to the consumer choice implications of this in a future report.

184. The Muslim method of slaughter (Halal) is, in many respects, similar to Shechita. However, pre-slaughter stunning methods for sheep and cattle that have been demonstrated not to kill the animal, such that the heart is still beating, have been deemed acceptable and have routinely been adopted in many Halal slaughterhouses.

185. Council has focused on three particular animal welfare issues with regard to slaughter without pre-stunning:-

- pre-slaughter handling;
- the potential for pain and distress during exsanguination; and
- the time to loss of brain responsiveness.

Pre-slaughter handling

Cattle

186. The level of restraint required to expose the throat, perform an effective cut and hold the animal still until it has bled out is greater than is needed for conventional slaughter. The restraining pens used for this purpose require Ministerial approval. This "is designed to protect bovine animals from any avoidable pain, suffering, agitation, injuries or contusions in the pen and in particular to ensure effective means of restraint and support" (WASK).

187. The design and operation of restraining pens are assessed by the SVS before Ministerial approval is given. We are concerned about the effectiveness of restraint and the distress caused to animals that we observed during our visits, particularly when smaller cattle were restrained. For instance, the head could slip out of the restraining

mechanism and there is also a risk of leg injuries. The operation of the restraint itself takes particular skill to ensure that the animal is held in an appropriate position with the neck extended for an effective cut to be made with speed and accuracy. Restraining pens of this type may cause higher levels of distress than conventional stunning boxes and for a longer period of time. Council would like all restraining pens currently in use to be re-evaluated, particularly in terms of the efficiency of restraint of animals of varying sizes.

188. We are mindful of the consequences should the chin lift be released or should the head become free after the neck cut has been made. This could result in the animal's head dropping forward onto the metal work of the restraining pen thereby causing further pain and distress. In addition, this could also result in the occlusion of severed blood vessels causing a restriction in blood loss and thereby potentially delaying the time to insensibility.

Recommendation

189. Government should arrange re-evaluation of all restraining pens currently in use, particularly in terms of the efficiency of restraint of animals of varying sizes.

Sheep

190. The manual restraint of sheep is entirely dependent on the skill, care and consideration of the handlers and is a physically demanding procedure. We were concerned with some of the illegal handling practices we saw where young sheep were lifted by the fleece. With larger, heavier animals the effort required to lift animals would be even greater. The risk is that the welfare of the animals, particularly with higher throughput, may be neglected for the sake of expediency.

191. There is equipment available for restraining sheep on-farm, for example crates used for husbandry procedures such as foot trimming, which we believe could be adapted for restraining sheep prior to this slaughter method.

Recommendations

192. The legislation prohibiting the lifting of sheep by the fleece should be enforced by the OVS.

193. Alternatives to manual restraint methods for sheep should be explored by the industry for use at slaughter without pre-stunning.

Pain and distress during exsanguination

194. We have carefully considered the representations we have received which have put forward the view that a neck cut is not painful provided it is a rapid, uninterrupted movement carried out with an extremely sharp knife. It is difficult to measure pain and distress during the slaughter process in an objective scientific manner and subjective

indicators, such as behavioural responses and vocalisation, are prevented from being displayed because of the degree of restraint and the severance of the trachea respectively. By the same token, it is impossible to state with objectivity that an animal would not feel pain and distress following such a procedure.

195. When a very large transverse incision is made across the neck a number of vital tissues are transected including: skin, muscle, trachea, oesophagus, carotid arteries, jugular veins, major nerve trunks (e.g. vagus and phrenic nerves) plus numerous minor nerves. Such a drastic cut will inevitably trigger a barrage of sensory information to the brain in a sensible (conscious) animal. We are persuaded that such a massive injury would result in very significant pain and distress in the period before insensibility supervenes.

196. Additionally, on one visit, we observed the slaughterman place his hand into the neck wound of cattle immediately after the cut had been made, presumably to try to ensure the free flow of blood from the severed carotid arteries (see 'occlusion' below). This procedure in itself is, in our view, likely to cause further unnecessary pain and distress and is also unlikely to achieve its objective.

Recommendation

197. Where an animal has not been stunned, the OVS must ensure that nothing is inserted into the neck wound post-cut.

Time to loss of brain responsiveness

198. Loss of sensibility post-cut can be detected by observing brain function through electroencephalographic methodology - a lack of response indicating certain insensibility or death. The scientific evidence shows that sheep become insensible within 5-7 seconds of the cut (3-7 seconds in goats). Adult cattle, however, may take between 22 and 40 seconds to become insensible. This period may be extended should occlusion of the carotid arteries take place. Work done on calves has shown a variation in period to insensibility from 10-120 seconds depending on the extent of occlusion of the carotid arteries or ballooning in blood vessels. Furthermore, a separate study of brain response after Shechita slaughter of cattle compared to that after captive-bolt stunning indicated responses for up to 60 seconds in the former and no response in the latter. (The difference in the times to loss of sensibility between the various species is due to anatomical differences in the blood supply to the brain).

199. Occlusion refers to a phenomenon observed in a proportion of cattle, and particularly in calves, when the carotid arteries have been severed transversely. Very rapidly after the cut, the carotids may, by virtue of their elasticity, retract into their own external connective tissue coat. The connective tissue becomes filled with blood, which then clots thereby occluding the flow of blood from the severed arteries by sealing the cut ends. Because the heart is still beating, the blood pressure in the anterior aorta is maintained and hence also in the vertebral artery. This latter vessel supplies the brain and

is not severed during the neck cut. Occlusion therefore has the effect of delaying insensibility for a considerable period and therefore increases the time during which an animal may be experiencing severe pain and distress.

200. Overall, we have looked at slaughter without pre-stunning against the basic principles set out at the beginning of our report which aim to ensure the welfare of animals at slaughter (see Paragraph 8). We consider that at least two of these principles – **pre-slaughter handling facilities that minimise stress** and **induction to a period of unconsciousness without distress** – are not satisfactorily observed. Given that the exemption from pre-stunning is subject to the requirement that unnecessary suffering is not inflicted, we consider that the Government should take steps to repeal this exemption.

Recommendation

201. Council considers that slaughter without pre-stunning is unacceptable and that the Government should repeal the current exemption.

202. The argument has been put to us that a pre-cut stun or an immediate post-cut stun adversely affects the efficiency of exsanguination and that this is a reason for not stunning animals during slaughter. Recent research carried out on the efficiency of bleed-out in sheep following slaughter shows that there is no significant difference in the rate of blood loss from a throat cut with or without stunning, whether the stunning is achieved by electrical means or by captive-bolt. We are therefore not persuaded by this argument. In any event, under optimal conditions, only approximately 50% of the body's total blood is exsanguinated at slaughter. Of the blood remaining in the carcass, the majority resides in the viscera (30%) with the rest in the muscles (20%). Therefore, any minor difference in the efficiency of bleed-out would have a very minimal effect on the amount of blood remaining in the tissues.

Recommendation

203. Until the current exemption which permits slaughter without pre-stunning is repealed, Council recommends that any animal not stunned before slaughter should receive an immediate post-cut stun.

Bleeding procedures

General

204. When an animal is stunned, the process of bleeding must take place without delay to ensure the animal dies through loss of blood before it regains consciousness. When a killing method is used, for example electrocution, there is no requirement to bleed under the welfare at slaughter regulations; however, this assumes the kill has been effective. In animal welfare terms we consider it good practice to bleed without delay, irrespective of

the stunning or killing method employed. The bleeding procedure itself must be correctly carried out to ensure rapid exsanguination.

Stunning to bleeding intervals

205. Electrical head only stunning of animals is reversible and any delay in bleeding the animal has serious welfare implications. The scientific evidence supports the recommendation that stun to bleed intervals should not exceed 15 seconds. Some slaughterhouses are not always able to achieve this.

206. There is a legal requirement in England and Wales (but not in Scotland) that animals should not be bled in sight of con-specifics. The stunned animals must be hoisted away from the stunning area thus delaying bleeding. There is now published evidence to support, in the case of pigs and sheep, that animal welfare is not compromised when they witness the bleeding of their conspecifics. We are aware that similar research is being done with goats and calves and publication of this data is a priority. Lengthy stun to bleed times significantly increase the risk of an animal regaining consciousness before it is dead and removing the legal obligation to bleed animals out of sight of each other should reduce this risk. FAWC believes that the law in England and Wales should be changed to permit bleeding within sight of conspecifics for sheep and pigs. This should be dependent upon legislation being introduced to limit the stun to bleed interval for head only electrical stunning to 15 seconds.

207. Cattle are held individually for stunning and cannot see others being bled. This situation should remain and, in future, if any change to these procedures were contemplated, then species-specific research should be required before any change could be considered.

208. Achieving rapid bleeding of animals depends on many factors, such as slaughter line design and the speed, skill and number of those involved in the shackling process. In premises where there are consistent delays, enforcement action must be taken and faults corrected.

209. With a wide variation in stunning and killing methods, the publishing, within a code of practice, of maximum stun to bleed times (or targets: excellent, good, fair, poor and unacceptable) on the basis of current research would be of use to both slaughterhouse operators and enforcement agencies.

Recommendations

210. The law should be changed in England and Wales to permit the bleeding of pigs and sheep within sight of their con-specifics, provided that, for head only electrical stunning, a maximum stun to bleed time of 15 seconds is set down in legislation.

211. Government's code of practice should set out targets/maxima for stun to bleed times for all species and for the range of stunning and killing methods currently in use.

Bleeding practices

212. The law states that "all animals which have been stunned must be bled by incising at least one of the carotid arteries or the vessels from which they arise". However, current practice in Great Britain is to cut a minimum of both carotid arteries and jugular veins or a thoracic stick to ensure rapid exsanguination. The legislation should be changed to require the severing of both carotid arteries. A number of studies have also looked at the time taken for loss of brain function when animals are bled by severing the vessels close to the heart as compared with cutting the carotid arteries. In all cases, severing blood vessels close to the heart in the chest produces a quicker death and this is particularly the case with calves.

Recommendations

213. The law should require that bleeding should be carried out by severing both carotid arteries.

214. The Government code of practice should recommend that thoracic bleeding methods should be used wherever practicable.

Pithing

215. It is now illegal to pith cattle whose meat is intended for human consumption. Whilst we fully support the change on public health grounds it must be recognised that it could lead to longer stun to bleed times due to the hoisting procedure and the difficulties of bleeding an animal that may still be convulsing. This further emphasises the need for maximum permissible stun to bleed times to be set down clearly in a code of practice.

Assessment of unconsciousness

216. There has been significant research work undertaken to define the signs of unconsciousness in animals effectively stunned or killed using a variety of methods. Although training courses and published guidance have improved some peoples' understanding, we have witnessed instances where the slaughterhouse staff, and even on occasions the enforcement team, are not clear what to look for. This information needs to be included in the codes of practice and as a separate short checklist for slaughter staff. Any relatively recent developments, such as electrical killing of cattle will also require the signs of an effective kill to be defined for practical use in the slaughterhouse.

Recommendation

217. Practical information on recognising the signs of unconsciousness in animals needs to be included in the codes of practice and as a separate short checklist for slaughter staff.

Mass killing for exotic disease control

218. During 2000 and 2001 two serious outbreaks of disease in farm animals raised the profile of mass killing of animals in disease control situations. First, an outbreak of Classical Swine Fever in 2000 and second the widespread outbreak of Foot and Mouth Disease in 2001. Both involved field killing of animals on affected and contiguous farms and on a huge scale in the Foot and Mouth Disease outbreak.

219. In January 2002, FAWC produced a report on the animal welfare aspects of the outbreak of Foot and Mouth Disease that presented the advice which Council had given throughout the event as well as our further thoughts on reflection afterwards. The full report is available on the FAWC Website (http://www.fawc.org.uk) or from the FAWC Secretariat (contact details at the end of this report). FAWC welcomes the revision of contingency plans by Defra, the production of a training package following the outbreak, and the increased attention given to biosecurity. However, we hope that Government will revisit FAWC's *report Foot and Mouth Disease 2001 and Animal Welfare: Lessons for the Future* in the light of the subsequent reports which have been published on this outbreak (including those from the Royal Society and the Royal Society of Edinburgh), and will now address our outstanding recommendations.

Recommendation

220. Government should revisit FAWC's report Foot and Mouth Disease 2001: Lessons for the Future *and address our outstanding recommendations, particularly with reference to killing techniques and equipment, and the licensing of field killing teams.*

On farm slaughter/killing

General

221. The law contains specific requirements to protect the welfare of animals slaughtered or killed outside of slaughterhouses. A slaughterman's licence is required for all on-farm slaughter (including routine culling of surplus newborn and unwanted, low value animals and non-emergency slaughter of casualty animals) except for: the killing of an animal by its owner for private consumption; immediate slaughter of an animal for reason of its welfare (i.e. emergency slaughter); and slaughter or killing for other than a commercial purpose (e.g. disease control). Culling is considered to be within the definition of commercial purpose as an activity that takes place as part of the farm business. A slaughterman's licence is not currently required for the use of a free bullet or shotgun; a fire arm or shotgun licence is required.

222. We recognise that on farm slaughtering and killing activities are regulated by WASK but, when compared with the same activities taking place in a licensed slaughterhouse, they may be unsupervised and subject to inadequate facilities and skills. There is also the added difficulty of enforcing WASK at farm level.

223. Where on farm slaughter or killing by the exempted methods is to be contemplated by unlicensed persons, they should be competent to carry out the task required and fully aware of the guidance available. The equipment used must be sufficient for the task and well maintained.

Casualty/emergency slaughter

224. Confusion has arisen around the use of common terminology in this area. "Casualty" animal and "emergency" slaughter are terms used loosely and outside their strict definitions. Some clarification of what constitutes a moveable or immovable "casualty" and when such an animal need be despatched immediately is required. The specialised divisions of the British Veterinary Association (BVA) have produced booklets on casualty slaughter of cattle sheep and pigs that have proved helpful in this area.

225. Reductions in the numbers of knackermen, hunt kennels and large animal veterinarians has reduced the availability of qualified persons to kill casualty animals/cull animals on farm. Such people cannot carry out private slaughter on farm on behalf of farmers.

Private slaughter

226. The Council has been made aware of confusion over the legislation relating to private slaughter. We welcome efforts by the Food Standards Agency to present the rules in a manner understandable to enforcement agencies and the industry but still feel that clarification is required. In particular, it would be better in terms of animal welfare and public health for a professional, licensed person to kill an animal and dress it on farm rather than an inexperienced person.

227. The facilities and experience of staff for handling and restraint during on farm slaughter may not be ideal. It would be better for animal welfare for farmers to send their animals to a local abattoir for slaughter and to receive back the dressed carcase, or meat.

Mobile slaughterhouses

228. A lack of local slaughterhouses has led to work being undertaken on the feasibility of mobile slaughterhouses mounted in articulated trailers and driven to farms to carry out in-situ slaughtering. This work has proved that mobile slaughterhouses are technically feasible but need to be more economically viable to cross over into practical commercial use. Mobile slaughterhouses can be licensed for use on farm but need a fixed base with basic facilities such as lairage and drainage to operate correctly. Provision of a fixed base may prove too expensive for single farms but co-operative action between numbers of livestock producers could make the operation economic.

229. There are other potential uses for mobile slaughterhouses that could be investigated, particularly where co-operation and high value or high throughput is

available, e.g. exotic species or cull animals. There are potential welfare benefits, from animals being slaughtered close to production and from the reduced transport requirement. However the cost involved with the disposal of waste products, as well as the high unit cost of small-scale use, remain problems.

Slaughter of deer

230. At the time of FAWC's Report on the Welfare of Farmed Deer (1985) there were concerns expressed about the slaughter of deer in slaughterhouses. The farmed deer industry has expanded considerably since then and understanding of deer and their handling and facilities have improved.

231. There are now a number of options for the slaughter of deer: shooting in the field, transport to a multi-species slaughterhouse, transport to a specialist deer slaughterhouse or a specialist slaughterhouse facility on farm. During our visits we observed the slaughter of both fallow and red deer in specialist facilities on farm. We discussed field killing with a number of informed parties.

232. Deer killed on the farm or park with a free bullet are bled in situ and then transported to a nearby slaughterhouse for dressing. The slaughterhouse may be on the farm itself in some circumstances. In many cases the stockman who normally tends the deer would carry out this procedure. It is our view that whoever kills deer in the field should be a qualified marksman. Normally, farmed deer are killed with a headshot whilst being fed in the field and those who use this method consider it to be a welfare-friendly procedure as no rounding-up, transportation, lairaging or handling of any kind is required. We have been informed that this is an acceptable method for a small number of animals to be shot in a session before the rest of the herd may become agitated. However, there is some debate as to the maximum number of deer that can be shot and this is likely to vary depending on the circumstances. We therefore feel that Government should investigate this matter and provide appropriate guidance.

233. Where a slaughterhouse is used, the ideal situation would be for deer to be slaughtered in purpose-built premises on the farm of production. However, we recognise that the deer slaughter industry may not yet be able to achieve this for all stock. We consider that where deer are slaughtered in multi-species facilities the lairaging and restraining facilities should, nevertheless, be specific to the species. Facilities designed for other species, such as cattle stunning boxes, are not suitable for deer slaughter. Deer are also stressed by the presence of other species in the slaughterhouse.

234. Fallow deer are smaller and generally more flighty than red deer, but all breeds require careful and considerate handling. Temperament was considered important by those we spoke to, particularly for safe pre-slaughter handling and for calm entry into the stunning area. Temperament will be determined to a degree by the genetic makeup of the animals, but also by the frequency and manner in which they are handled on the farm or park.

235. Indoor lairages for deer tend to have subdued lighting to keep deer calm, and high partition walls of material such as stockboard, both to reduce noise and to prevent escape and injury. It is also helpful if deer can see others through gaps in the partitions and if raceways are so constructed that it causes minimum stress when animals are being moved around the lairage. Disturbance from stockmen should be kept to a minimum and it is preferable that they are experienced in the requirements and handling of the species. Outdoor lairages also should have fencing suitable for preventing the escape of deer and handling systems between them and the slaughterhouse which suit their behaviour.

236. Pre-slaughter handling should be carried out as calmly as possible and the route from lairage to stunning area should be as direct as possible. Where a deer slaughterhouse is located on a farm there is a distinct advantage in having stockmen familiar with the deer involved in pre-slaughter handling. Deer can be conditioned to certain handling systems on the farm, which, if replicated in the slaughterhouse, should keep them calmer than would be the case in an unfamiliar system.

237. We consider that the most suitable restraint for deer is a drop-floor stunning crate, possibly with a side push facility designed into it. We have observed that these systems keep deer relatively still and calm whilst stunning is carried out. Manual restraint of deer during stunning is likely to be more stressful for the animals and may be dangerous to the slaughtermen.

238. The welfare at slaughter legislation is not written specifically with deer in mind. Where deer have specific needs for protection in the law this should be provided.

Recommendations

239. Government should provide guidance on the killing of deer in the field.

240. Facilities used for lairaging and restraining deer, wherever they are killed, should be specifically designed for the purpose.

241. Deer should be stunned within a drop-floor crate to enable them to be firmly but calmly restrained.

242. The welfare legislation should, where necessary, protect deer by referring to their specific needs.

Slaughter of ostriches

243. We note that MAFF issued guidance notes on ostrich slaughter during the 1990's and welcome the fact that the new code of practice on the slaughter of red meat animals will cover their slaughter. However, there is no specific coverage for ostrich, or other ratites, within the welfare at slaughter legislation (WASK). Definitions under WASK need to be clarified to ensure that ratites are treated as red meat animals and not poultry, or if necessary as a distinct category of animal. Some of the conditions applicable to

poultry are clearly not acceptable, for example killing methods allowing decapitation and dislocation. Should ratites other than ostrich be slaughtered in the future, the conditions should be carefully assessed and the recommendations of this report applied where relevant.

244. We visited an on-farm abattoir specifically designed for slaughtering ostriches, which offered a view of current practices and we were impressed by the operation observed. However, we are concerned that the legislation is not clear enough to protect the welfare of ostriches in all cases.

245. Pre-slaughter handling needs to be quiet and calm. The lairage facilities should be designed with the size of the animals in mind. Handlers must be aware that these are inquisitive animals likely to explore their surroundings and the people in contact with them. Birds should be kept in view to avoid surprise contact. Birds are gathered prior to slaughter in a smaller space and with reduced lighting to calm them.

246. Restraint of ostriches is a difficult procedure since they are such powerful and potentially dangerous animals. In the abattoir observed individual birds were moved into a v-shaped crush with one handler behind to guide and restrain while two others prepared the ostrich for stunning using a foot bar and chains under the wings (not used to lift the bird but for support once it was unconscious).

247. Electric tongs were used to stun birds. There is a need for accurate placement on a small, mobile head target. The leg bar is required because of vigorous convulsive kicking post-stun. Stunning without restraining the legs would be dangerous for all involved. Another method available is captive-bolt stunning, but we believe that there should be further assessment of its effectiveness before it is approved. Government, in a code of practice, should define an acceptable method of backup or for emergency slaughter.

248. Once the convulsive movement has abated the birds are shackled by both feet and taken to a separate bleeding area before the next bird is admitted into the stunning area. In the slaughterhouse visited, ostrich were bled by a cut across the front of the neck followed by dislocation of the neck. This ensures that the bird cannot recover. There should be maximum stun to stick times determined for ostrich and these should be published in a code of practice.

Recommendations

249. Welfare at slaughter legislation must be changed to ensure ratites are treated as red meat animals and, if necessary, as a distinct category of animal.

250. Ratites must be individually restrained for slaughter in a system designed to minimise stress.

251. Government should identify best practice for the slaughter and emergency killing of ratites in a code of practice.

Slaughter of wild boar

252. There are limited options for slaughter and killing of wild boar. They are shot in the field or slaughtered in either multi-species slaughterhouses or in dedicated facilities.

253. There are few abattoirs willing or able to deal with the slaughter of wild boar in the UK. They are a difficult species to deal with and are designated as dangerous wild animals under current legislation. We observed slaughter of this species in a small, multi-species slaughterhouse, which had been set up to cope with the needs of local farmers producing a variety of species.

254. Wild boar should not wait on lorries at the slaughterhouse but be unloaded immediately on arrival. Once unloaded into the lairage they should be held together in familiar groups. It is clearly important that the design of the unloading facilities and the lairage are high sided such that escape is made impossible. The lairage facilities themselves should be designed so that animals can be moved to the killing pen with relative ease, as wild boar do not necessarily respond to the normal herding methods used for domestic pigs. We consider that where wild boar are slaughtered in multi-species facilities the lairaging and restraining facilities should, nevertheless, be specific to the species.

255. We were informed that a number of stunning and killing methods have been tried for wild boar. Stunning in a group pen using electric tongs was quickly abandoned in some premises since it seemed stressful for the animals and hazardous for the slaughterman. However, we understand that this method has been used successfully elsewhere. A rifle with soft nosed ammunition was used but also abandoned due to the hazard of bullets ricocheting around the killing pen. A better method is the use of a shotgun which produces instantaneous death from a frontal head shot taken at a distance of 1 to 3 metres. The weapon is, however, noisy in an enclosed space.

256. An individual wild boar should be directed into the killing pen using boards as for domesticated pigs. This is a skilful and dangerous procedure, as the handler has to work amongst the animals. It may sometimes be impossible to separate a single animal, and may be more stressful to try to do so. Animals being shot should be confined in the killing pen and left to quieten down before a shot is taken. Slaughtermen should be expert marksmen or should receive training to bring them up to the required standard. There should be a Code of Practice for the slaughter of wild boar and other exotic species, which gives advice on acceptable methods of killing.

257. Wild boar may be killed in the field, but we have not witnessed this procedure. The same comments that apply to marksmen in abattoirs would apply to field killing.

Recommendations

258. Unloading and lairage facilities must be such as to ensure that wild boar cannot escape from the abattoir.

259. Government should produce a Code of Practice for the slaughter of wild boar and other exotic species.

Slaughter of horses

260. FAWC has not addressed the welfare of horses at slaughter before. At the time of writing there were only two specialist slaughterhouses killing horses in GB, one in the north and one in the south of England. Some horses were transported long distances for killing by this route, however, it was pointed out to us that many horses, but not all, were accustomed to travelling long distances to shows and sporting events. We were informed that the service provided elective euthanasia for private owners and a humane method of disposal for wild breeds as and when required. The meat produced gave some value back to the owner and helped support this welfare friendly disposal route.

261. If those involved in the slaughter of horses are experienced in dealing with them and are used to their handling then they are likely to put this expertise into all elements of the design and operation of the killing procedure. The presence of owners, who have brought their horses for disposal may also ensure the quality of the procedure.

262. Horses should be unloaded onto a raised area to ensure that the exit from the horsebox, trailer or lorry was as level as possible. Most of the private owners' horses are unloaded directly to the killing area, rather than spending time in a lairage, thereby speeding their despatch. We were told that delivery of animals in poor condition was rare but did occur occasionally. Tracing the origin of some animals is difficult given the current lack of identification requirements.

263. The lairage used for horses should be designed with these animals' particular needs in mind, e.g. narrow gaps between pen bars to avoid legs getting trapped and possibly broken. It is also important to allow for the adequate separation of fractious animals (e.g. some stallions) that may be prone to fighting.

264. In the slaughterhouse we observed most horses were led to the killing room by a simple rope halter. Some animals that were difficult to handle were sometimes led into the killing room along with an accompanying horse. Once both were calm the accompanying horse would be led away whilst the difficult one was shot. Council believes that research should be carried out to see if the welfare of some horses would benefit from being accompanied by another in order to keep them calm before they are shot and to determine the effect of horses observing the killing of their conspecifics.

265. Wild ponies (e.g. Dartmoor ponies) would be driven from the lairage down a race to be gathered outside the killing room. These were sometimes shot from the door of the

killing room, from a range of around 3 metres. This was seen to be less stressful than trying to restrain them.

266. Within the killing room observed the slaughterman quietly restrained the horse with a rope halter and shot the animal in the forehead with a .22 rifle and using hollow nosed bullets. By using a rifle the angle of shot could be altered where necessary with only small movements of the hand and wrist. Horses were despatched in a calm, unrushed manner and the slaughter line did not dictate the rate of kills. If a stunning method were to be used on horses, then guidance would be required on stun to stick times.

Recommendations

267. Government should fund research into the welfare implications of difficult-to-handle horses being accompanied by another, calmer animal during slaughter.

268. If a stunning method were to be used during the slaughter of horses then Government should provide guidance on maximum stun to stick time.

Licensing, training and staffing

Licensing system

269. The Welfare of Animals (Slaughter or Killing) Regulations 1995 lay down the conditions under which a licence to slaughter animals may be granted. In particular the applicant must have obtained a certificate of competence issued by an authorised veterinary surgeon. The certificate of competence must specify the operations, species, equipment or instruments for which the applicant has been assessed and a licence will only be issued for these activities. Once a licence has been issued it is valid for life unless revoked or suspended.

270. In the majority of cases the issue of certificates of competence is carried out by the OVS who is in a position to observe the individual over a period of time. The OVS may in some cases also be responsible for the basic training of that individual. Training responsibilities are often seen as part of the role of the OVS by the slaughterhouse management and there must be some concern that this does not sit comfortably with the OVS' accreditation and enforcement roles. In our view the same OVS should not be the trainer, issuer of a certificate of competence and enforcement officer.

271. The achievement of more uniform standards across Great Britain than those achieved by the previous Local Authority system is perceived as one of the advantages of centralisation. Guidelines on competence requirements have been issued to all MHS veterinary staff. However, we are still concerned that the existing licensing system may not necessarily produce consistent standards. The relevance of a certificate of competence is heavily reliant on the expertise of the individual OVS. The assessor will usually be experienced in the operations to be assessed but this is not always the case.

There is no requirement on the OVS to have reached a level of competence either on the operations or on assessment. They may be new to slaughterhouse work or newly qualified.

272. Where competence assessment is carried out it is good practice for the assessor to be independent of the person being assessed. To make the system more robust, assessment prior to the issuing of certificates of competence should be undertaken by independent staff trained in the operations themselves and specifically in assessment - possibly the Principal OVS for the region.

273. FAWC is not convinced that the current `license for life` is appropriate and a renewal process would form an important part of the integrity of the licensing procedure. Equipment and slaughtering techniques change over time. However, at the moment it is possible for someone who has not been actively slaughtering animals for many years to work as a licensed operative with little or no up to date knowledge. Unless a licence is renewed every three years it should be automatically downgraded to a provisional, which would mean that the individual could operate but only under supervision and would then have to re-apply for their full licence.

Recommendations

274. A licence to slaughter should be granted by the MHS only to those who achieve an independently assessed and verified level of competence.

275. The competence of those holding licences to slaughter should be re-assessed by the MHS every three years. If a licence is not renewed then there should be an automatic downgrading to provisional status.

276. The legislation regarding licensing requirements extends beyond the slaughterhouse and there is much inconsistency and confusion dependant on where the animal is killed, the species and who kills it. For example, those who are commercially employed killing animals by free bullet do not require a slaughterman's licence whereas a farmer despatching an animal on farm with a captive-bolt stunner would do.

277. In the light of recent experience of tackling Foot and Mouth Disease, licensing should take more account of the different skills needed in the field as opposed to the slaughterhouse. It should also differentiate between the `field professional` (knackermen, hunt staff, RSPCA inspectors and veterinary surgeons) and the farmer or stockman who would slaughter an animal only rarely. Licensing requirements should be appropriate to the practice undertaken. Assessors should be competent in the relevant situations, weapons and species.

Recommendation

278. Government should review the current slaughter licensing system and appropriate qualification and assessment systems should be developed for farmers, stockmen, slaughterhouse workers and field professionals.

Training

279. Training is the process of bringing a person up to a desired standard by instruction and practice. In recent years there has been an increasing emphasis on the need for formal training and there are currently a number of avenues by which both stockmen and slaughtermen may be trained:

- An individual may be trained whilst working alongside another more experienced employee; slaughterhouse management may monitor progress or devolve that responsibility to the OVS;
- A number of operators have developed their own in-house training programmes conducted by either external or internal personnel. Once again the OVS may or may not take part in such a programme; and
- There are now formal qualifications for slaughtermen and handlers through the NVQ/SNVQ route at levels 1 and 2. Under these schemes there is no prescribed training course but there are quality standards with regard to the competencies required and their assessment.

280. There has been an increase in the quality and quantity of material available to slaughterhouses to assist them with training but the extent to which it is used seems variable. For any training to be effective there needs to be a commitment on the part of both slaughterhouse management and the individual to be trained.

281. Many consultees called for continued improvement in training. With a wide variation in slaughterhouse size, species and equipment, strictly dictating the training to be undertaken would be inappropriate. Therefore, there should be flexibility and choice to reflect both the operation and a trainee's needs and abilities. However, animal welfare at slaughter must form an integral part of the training of any individual working in the slaughterhouse.

Recommendations

282. All slaughterhouses should have an appropriate training regime for all staff to ensure adequate levels of competence. Individual training records should be kept.

283. Animal welfare at slaughter must form an integral part of the training of any individual working with live animals in the slaughterhouse

Staffing

284. It is important to avoid fatigue on the slaughter line and staffing rates should reflect this. During the course of our visits we looked at the practice of rotating slaughter staff as a means of preventing fatigue, and possible complacency, caused by performing arguably a 'routine' task on living animals. The practice was mainly restricted to larger operations. Usually, slaughterhouses favoured the use of a small group of staff to carry out both stunning and the lairage operations. We are of the opinion that rotation is only beneficial to animal welfare if each member of the team is competent in all of the tasks the team performs. It is important that sufficient competent slaughter staff are on duty to cover in the event of fatigue or illness.

Recommendations

285. The OVS must ensure that the welfare of the animals being slaughtered is not compromised by operator fatigue.

286. Rotation of staff in large throughput operations should be a standard operating procedure. However, slaughterhouse operators must ensure that rotation of staff is practised only if the personnel involved are competent in all of the relevant tasks.

Animal Welfare Officers

287. The Animal Welfare Officer (AWO) Course developed by the University of Bristol Department of Animal Science has attained a high level of recognition. The objective of the course is to assist in the transfer of science and ideas into the practical environment. Staff attendance on the course is now a requirement of many of the national and retailer assurance schemes. Although the course has attained a high level of recognition we believe that the role of the AWO should be formalised in legislation and their responsibilities should be outlined in the relevant code of practice. Comments from some of the AWOs themselves are that the course has no element of testing to it, merely a certificate of attendance. We believe there is merit in the course providers considering a system of formal assessment**.**

288. The AWO course has been successful in attracting staff from the larger slaughterhouses. However, both the cost and the time factor may make it out of the reach of many of those operating smaller enterprises. In the same way that Government has assisted smaller businesses in training in food hygiene there is a need to support animal welfare training.

Recommendations

289. The role of the AWO should be formalised in legislation and guidance as to their responsibilities should be outlined in the Government code of practice.

290. The AWO course operators should consider developing a system for formal assessment.

291. Assistance should be given by Government to ensure that small to medium sized enterprises have access to AWO training.

Legislation and enforcement

Legislation

292. Legislation should be clear and enforceable otherwise it may fail to achieve its aims. The UK must implement the EU Slaughter Directive, which provides the basic framework for legislation. This can create dilemmas in the provision of strong, enforceable legislation. Where the Directive is prescriptive, law in Great Britain must comply. On the other hand, Government should not feel constrained from proceeding where there is a clear animal welfare benefit from a change to the law that goes beyond the Directive. Where the Directive is more general then there must be clear guidance available to slaughterhouse operators and enforcement officers.

293. Our study has highlighted areas where legislation made in other areas has a direct effect on the welfare of animals at slaughter (e.g. meat hygiene, identification, clean livestock policy, pithing). We are concerned that there is little attempt to identify welfare issues before legislation is implemented. Where any food animal is involved we believe there should be an animal welfare impact assessment as a part of the consultation process. Balancing meat hygiene legislation with animal welfare is a difficult task for the OVS and whilst the former must take priority this does not mean that animal welfare should be compromised.

Recommendations

294. Where legislation is being introduced affecting farm animals at slaughter but which is not directly related to animal welfare, e.g. for food hygiene, disease control or traceability purposes, the Government Department involved should carry out an animal welfare impact assessment as part of the consultation process.

Enforcement

Enforcement sanctions

295. The MHS have a number of ways to deal with an animal welfare problem. Initially they will give informal verbal advice. If this is not effective then a written warning can follow which may produce the desired results. Prosecution is a last resort and can only be contemplated where there is a clear breach of legislation. In the MHS welfare review 2000, there were 161 non-compliances with the legislative requirements recorded in the week the survey was undertaken. Although none of these were said to have resulted in any adverse effect on the animals it poses questions as to the

effectiveness of enforcement and to the fact that the enforcement officers have no intermediate option between a written warning and redress to the courts. If an issue is not sufficiently serious to warrant prosecution, an operator may feel he can take his time about acting.

296. A slaughterhouse may be in breach of the legislation but action cannot be taken because there is no clear cut case of animal cruelty that would stand up in a court of law. There is, therefore, a need for a wider range of sanctions such as the ability to issue a notice, which prevents structures, equipment or practices being further used or undertaken until the fault or problem has been rectified. The ultimate sanction would be the ability to immediately close the slaughter line until improvements are made.

Recommendation

297. Government should introduce a system of formal improvement notices for structures, equipment or practices that do not comply with the law and have the potential to cause animal welfare problems.

Training of enforcement staff

298. Veterinarians are probably the best qualified generalists in animal welfare matters. However, it must be recognised that there is a need for some specialist knowledge when supervising the welfare of animals at slaughter. There is a considerable range in depth and breadth of such knowledge among the supervising veterinarians and this has been picked up by both the MHS' own surveys and audits carried out by the Veterinary Public Health Unit.

299. The MHS operations manual provides specific advice on welfare issues and is updated on a regular basis. This should ensure MHS staff are aware of the latest developments. All OVSs receive specialist training before beginning work and thereafter. There are also training initiatives such as the OVS refresher course that have welfare elements. FAWC welcomes mandatory Continuing Professional Development (CPD) programmes for OVSs and recommends that a welfare element should always be included.

300. The meat inspection team also has a role in monitoring animal welfare standards. Meat inspectors have access to an accredited CPD module on animal welfare designed to broaden the knowledge of the inspector as well as to bring them up to date on more basic practices.

Recommendation

301. Attendance on animal welfare modules should be a required element of Continuing Professional Development for MHS staff.

Level of veterinary supervision

302. There must be full veterinary supervision of ante mortem inspection and also during the slaughter process. However, where veterinary resources are scarce there may be a role for specifically trained auxiliaries, acting under veterinary supervision, who could carry out other elements of the day to day welfare monitoring done by the OVS.

Recommendation

303. Government and the MHS should consider the use of auxiliaries, specifically trained and under veterinary supervision, to undertake some of the welfare monitoring currently carried out by the OVS.

Research, development and technology transfer

304. Good scientific research is essential for the development of both legislation and best practice. The results from research must be disseminated as widely as possible and new concepts should be evaluated by the industry.

305. There are relatively few institutions within Great Britain involved with research into the welfare of animals at slaughter. Despite this there seems to be a general lack of co-ordination and co-operation between them. This is likely to be the result of competition for funds. Priorities for research are also specified by Government and this tends to confine proposals. Thus there is little encouragement or opportunity for researchers to explore minority concerns. The funding system needs to be more flexible so as to provide funding for more short term projects, perhaps with greater collaboration from industry partners.

306. The time frame from initiation of research to published results is frustratingly long. Many of the research projects emanating from the FAWC recommendations for research made in the 1984 report have only recently been completed. At recent reviews of Government funded research into the welfare of animals at slaughter there were numerous projects which were completed several years ago but the results of which had only just been published.

307. There is some concern about the lack of technology transfer from research to industry. We believe that Government should enforce the technology transfer component of any research contract or alternatively fund that component separately. It is important that information is disseminated as quickly and as widely as possible. It is often assumed that because a paper is featured in one of the major scientific journals it will be widely read within all sectors. The larger operators have the resources to keep up to date with new initiatives but many small to medium scale businesses do not. In matters of animal welfare FAWC believes that Government has the prime responsibility to ensure that the messages from research are put across in a clear and simple form to all operators. Commitment to technology transfer should form part of the invitation to tender for research work and the resulting research contract.

Recommendation

308. The results of research into welfare at slaughter must be disseminated as quickly and as widely as possible, with the mechanism for technology transfer being clearly set out when the contract is awarded.

SUMMARY OF RECOMMENDATIONS

Design, construction and operation of the slaughterhouse

Unloading

Arrival at the slaughterhouse

25. Efficient scheduling procedures should be implemented by slaughterhouse operators so that animals do not have to wait to be unloaded.

26. If animals' waiting time on lorries regularly exceeds 30 minutes, it is incumbent on the OVS to take enforcement action.

Design of unloading area

31. Government should make it a legal requirement that slaughterhouses provide facilities to enable animals to exit lorries on the level, in all but low throughput slaughterhouses.

32. Detailed guidance should be produced by Government relating to design of unloading bays, as well as unloading points for farm trailers. This information should be widely distributed to all slaughter premises.

Inspection of animals

36. A designated and competent member of staff who has been trained in animal welfare, must be required by law to be present throughout unloading and their duties should be outlined in a code of practice.

37. The MHS must ensure that its staff receives training and regular updating on legislation relating to welfare during transport, and there should be greater co-operation with Local Authorities on transport issues.

38. Local Authority enforcement officers should undertake regular checks on livestock transporters at slaughterhouses.

Isolation pens, procedures for casualty animals and emergency slaughter

42. The slaughterhouse operator must ensure that isolation pens are kept ready for their intended use.

43. The slaughterhouse operator must ensure that procedures for emergency slaughter, and the telephone number of an out of hours duty slaughterman and other emergency contacts, are clearly displayed at the unloading point so that any animal in

obvious pain or distress on arrival at the slaughterhouse can be slaughtered or killed immediately.

The lairage

Time spent in the lairage

47. Lairage times optimal for animal welfare, along with needs for water feed and space over time, for each species should be included in Government's code of practice.

Lairage capacity

51. The Food Standards Agency should ensure that the approval process for new premises, currently undertaken as a means of ensuring compliance with meat hygiene requirements, should include animal welfare objectives.

52. The Food Standards Agency should ensure that all slaughterhouses undergo a formal review of their structural approval every five years to ensure animal welfare requirements are met.

Lairage layout

55. When designing new slaughterhouses or re-designing existing ones, operators must ensure compliance with the legal requirement that the place of slaughter or killing should be sited so as to minimise the handling of the animal.

Lairage floors

59. Government should issue guidance to slaughterhouses on suitable species-specific solutions for non-slip flooring. More evaluation is needed of new materials which might provide a non-slip but hygienic, easy clean surface.

60. Slaughterhouse operators and the MHS should implement a scoring system of animals' slips and falls as a means of regularly assessing floor conditions, design problems and standards of handling in their slaughterhouse.

Noise in the lairage

67. The slaughterhouse operator should monitor levels of vocalisation within the handling system and, where they are beyond acceptable limits, should identify the cause of the problem and rectify it (see Appendix D).

68. Government should fund research on noise in slaughterhouses and its effects on the welfare of livestock. This should lead to maximum noise levels and exposure limits being set for animals. This should be supported by guidance from Government for slaughterhouse operators on practical steps to baffle or reduce noise.

Ventilation in the lairage

71. Government should provide specialist advice on lairage ventilation. In addition, there should be clear guidance on limits for temperature, ammonia and humidity for slaughterhouse lairages.

Provision of feed and water in the lairage

76. Government should provide advice on optimum schedules for feeding and watering prior to slaughter, taking into account the travelling and marketing time animals may have undergone.

77. The MHS should remind slaughterhouse operators of the legal requirement to make water available to all animals at all times in the lairage and ensure that this is enforced.

Space allowance in the lairage

79. Government should issue guidance on minimum space allowances based on existing knowledge. These should be published as a matter of urgency. Research should be conducted to establish optimum stocking densities for all species applied across a range of circumstances.

Mixing of livestock in the lairage

82. Government should issue guidance to operators on the effects of mixing of livestock in slaughterhouses.

83. Slaughterhouse operators should ensure that their lairage design reflects the need to avoid mixing unfamiliar groups of either cattle or pigs.

Showering pigs

85. Government should issue guidance on showering regimes for pigs in slaughterhouse lairages in its code of practice.

Field lairages

89. Government must ensure that field lairages contiguous to slaughterhouses are defined as being within the curtilage of the premises.

90. Government should issue guidance on the proper management of field lairages to prevent the risk of disease build up, preserve good conditions underfoot and maintain adequate pasture.

Handling of animals prior to stunning

Design of pre-slaughter handling systems

95. Government and the industry should establish a design resource, based on the best available data from research and practice, for animal handling systems from unloading up to the point of slaughter.

Handling for identification

97. Government should ensure that any future introduction to Great Britain of methods of animal identification take account of the welfare implications of animal handling in slaughterhouses.

Handling to fulfil the requirements of the clean livestock policy

102. Slaughterhouse operators should actively discourage presentation of dirty livestock for slaughter and should not see the provision of a routine cleaning service as a routine part of their operation. If a producer persistently presents dirty animals for slaughter the OVS should instigate an investigation through the SVS.

103. Government should issue guidance to slaughterhouse operators and enforcement officers with regard to acceptable equipment and procedures for cleaning of animals.

104. Where clipping and shearing has to be carried out at the slaughterhouse, facilities should be suitable for the purpose and the procedure carried out by trained, competent operators.

105. Where washing has to be undertaken at the slaughterhouse we recommend that water pressure and temperature limits are set and if any animal shows obvious signs of distress or requires unreasonable levels of restraint, pressure washing should be ceased immediately.

Handling aids and goads

108. Electric goads should only be used in exceptional circumstances.

109. The slaughterhouse operator should monitor levels of goading within the handling system and, where they are beyond acceptable limits, should identify the cause of the problem and rectify it (see Appendix D).

Horned cattle

113. FAWC believes that horned cattle, or recently de-horned cattle with unhealed wounds, should not be presented for slaughter, with the exception of defined specialised breeds of cattle for which specific arrangements should be made.

Handling of cattle before stunning

118. Slaughterhouse operators must ensure that cattle are not allowed to enter the handling system unless staff are ready to stun and slaughter immediately.

119. Guidance should be given in the design resource to be established by Government and the industry on the design of stunning boxes.

120. All stunning boxes should have a level floor; all new installations with immediate effect and all boxes by 2008.

121. Legislation that requires stunning boxes to be fitted with some device that restricts the movement of the animal's head must be enforced by the MHS.

Handling of pigs and sheep before stunning

Group stunning pens

126. Government should include criteria for the design and operation of group stunning pens for pigs in its code of practice.

127. Government should fund research to evaluate optimum criteria for design of group stunning pens for sheep, calves and goats.

Restrainer/conveyers

133. The use of goads should not be considered a routine requirement of any pre-slaughter handling system.

134. Animals must never be left waiting in restrainers. In the event of a breakdown they should be able to be evacuated or killed in situ.

Pre-slaughter handling of pigs in gas killing systems

138. The design resource to be established by Government and the industry should include handling systems that allow groups of pigs to calmly enter gas killing systems.

139. Electric goads should not be used in any gas stunning/killing handling system.

Stunning and killing

System of approval for stunning/killing equipment

143. Government should establish a mandatory system of approval for stunning/killing equipment to ensure suitability for the purpose intended.

Maintenance of equipment

146. The OVS should monitor the keeping of records of slaughter equipment maintenance.

Monitoring of stunning

149. Monitoring by slaughterhouse operators of the stunning/killing procedure should be audited by the OVS.

150. The use and continued development of devices to monitor stunning equipment should be pursued by Government and industry organisations.

Back-up systems

152. Whenever the slaughterhouse is operating, the OVS should rigorously enforce the requirement that back-up stunning or killing equipment must be ready for use at the point of stunning or killing.

153. In larger premises, where the lairage is separated from the slaughter line, slaughterhouse operators should ensure that back-up killing equipment is kept in the lairage area to deal quickly with animals in pain or suffering.

Gas stunning/killing of pigs

Carbon dioxide and alternative gas mixtures

160. Government and the industry should fund research and development into the use of non-aversive gas mixtures. The use of aversive gas mixtures should be phased out within five years.

Electrical stunning/killing

Tong position

167. Tong positioning and effectiveness of stun should be monitored by the OVS and slaughterhouse managers with action being taken if performance falls below acceptable levels.

Equipment specifications

170. Government should produce clear species-specific guidance on currents and application times for electrical stunning.

Electrical stunning/killing systems for cattle

177. Electrical stunning/killing systems for cattle must be closely monitored and maintained by the slaughterhouse operator to ensure effective stunning/killing.

178. Government should produce guidance for slaughterhouse operators on recognising an effective stun/kill when using electrical equipment on cattle.

Slaughter

Slaughter without pre-stunning

189. Government should arrange re-evaluation of all restraining pens currently in use, particularly in terms of the efficiency of restraint of animals of various sizes.

192. The legislation prohibiting the lifting of sheep by the fleece should be enforced by the OVS.

193. Alternatives to manual restraint methods for sheep should be explored by the industry for use at slaughter without pre-stunning.

197. Where an animal has not been stunned, the OVS must ensure that nothing is inserted into the neck wound post-cut.

201. Council considers that slaughter without pre-stunning is unacceptable and that the Government should repeal the current exemption.

203. Until the current exemption which permits slaughter without pre-stunning is repealed, Council recommends that any animal not stunned before slaughter should receive an immediate post-cut stun.

Bleeding procedures

Stunning to bleeding intervals

210. The law should be changed to permit the bleeding of pigs and sheep within sight of their con-specifics in England and Wales, provided that a maximum stun to bleed time of 15 seconds is set down in legislation.

211. Government's code of practice should set out targets for stun to bleed times for all species and for the range of stunning and killing methods currently in use.

Bleeding practices

213. The law should require that bleeding should be carried out by severing both carotid arteries.

214. The Government code of practice should recommend that thoracic bleeding methods should be used wherever practicable.

Assessment of unconsciousness

217. Practical information on recognising the signs of unconsciousness in animals needs to be included in the code of practice and as a separate short checklist for slaughter staff.

Mass killing for exotic disease control

220. Government should revisit FAWC's report Foot and Mouth Disease 2001: Lessons for the Future *and address our outstanding recommendations, particularly with reference to killing techniques and equipment, and the licensing of field killing teams.*

Slaughter of deer

239. Government should provide guidance on the killing of deer in the field.

240. Facilities used for lairaging and restraining deer, wherever they are killed, should be specifically designed for the purpose.

241. Deer should be stunned within a drop-floor crate to enable them to be firmly but calmly restrained.

242. The welfare legislation should, where necessary, protect deer by referring to their specific needs.

Slaughter of ostrich

249. Welfare at slaughter legislation must be changed to ensure ratites are treated as red meat animals and, if necessary, as a distinct category of animal.

250. Ratites must be individually restrained for slaughter in a system designed to minimise stress.

251. Government should identify best practice for the slaughter and emergency killing of ratites in a code of practice.

Slaughter of wild boar

258. Unloading and lairage facilities must be such as to ensure that wild boar cannot escape from the abattoir.

259. Government should produce a Code of Practice for the slaughter of wild boar and other exotic species.

Slaughter of horses

267. Government should fund research into the welfare implications of difficult-to-handle horses being accompanied by another, calmer horse during slaughter.

268. If a stunning method were to be used during the slaughter of horses then Government should provide guidance on maximum stun to stick time.

Licensing, training and staffing

Licensing system

274. A licence to slaughter should be granted by the MHS only to those who achieve an independently assessed and verified level of competence.

275. The competence of those holding licences to slaughter should be re-assessed by the MHS every three years. If a licence is not renewed then there should be an automatic downgrading to provisional status.

278. Government should review the current slaughter licensing system and appropriate qualification and assessment systems should be developed for farmers, stockmen, slaughterhouse workers and field professionals.

Training

282. All slaughterhouses should have an appropriate training regime for all staff to ensure adequate levels of competence. Individual training records should be kept.

283. Animal welfare at slaughter must form an integral part of the training of any individual working with live animals in the slaughterhouse

Staffing

285. The OVS must ensure that the welfare of the animals being slaughtered is not compromised by operator fatigue.

286. Rotation of staff in large throughput operations should be a standard operating procedure. However, slaughterhouse operators must ensure that rotation of staff is practised only if the personnel involved are competent in all of the relevant tasks.

Animal Welfare Officers

289. The role of the AWO should be formalised in legislation and guidance as to their responsibilities should be outlined in the relevant Government code of practice.

290. The AWO course operators should consider developing a system for formal assessment.

291. Assistance should be given by Government to ensure that small to medium sized enterprises have access to AWO training.

Legislation and enforcement

Legislation

294. Where legislation is being introduced affecting farm animals at slaughter but which is not directly related to animal welfare, e.g. for food hygiene, disease control or traceability purposes, the Government Department involved should carry out an animal welfare impact assessment as part of the consultation process.

Enforcement

Enforcement sanctions

297. Government should introduce a system of formal improvement notices for structures, equipment or practices that do not comply with the law and have the potential to cause animal welfare problems.

Training of enforcement staff

301. Attendance on animal welfare modules should be a required element of Continuing Professional Development for MHS staff.

Level of veterinary supervision

303. Government and the MHS should consider the use of auxiliaries, specifically trained and under veterinary supervision, to undertake some of the welfare monitoring currently carried out by the OVS.

Research, development and technology transfer

308. The results of research into welfare at slaughter must be disseminated as quickly and as widely as possible, with the mechanism for technology transfer being clearly set out when the contract is awarded.

APPENDIX A

MEMBERSHIP OF THE FARM ANIMAL WELFARE COUNCIL

Dr Judy MacArthur Clark *(Chairwoman)*
Mr Ian Baker
Mrs Rosemary Berry
Mr John Don
Professor Peter English
Mr Graham Godbold
Mr Eddie Harper
Mr David Henderson
Ms Victoria Hird
Mr James Hook
Professor Alistair Lawrence
Mr Stephen Lister
Mr Gareth Lloyd
Mr Richard Maunder
Professor John McInerney, OBE
Miss Miriam Parker
Dr Martin Potter
Mrs Barbara Smith
Mr Michael Vaughan

APPENDIX B

THOSE WHO GAVE EVIDENCE

Assured Food Standards
Animal Health Trust
Animal Welfare Science, Ethics and Law Veterinary Association
Association of Meat Inspectors
Biotechnology and Biological Sciences Research Council
Board of Deputies of British Jews
British Cattle Veterinary Association
British Deer Farmers Association
British Goat Society
British Meat Federation
British Meat Manufacturers Association
British Veterinary Association
British Wild Boar Association
Cambac JMA Research
Campaign for the Protection of Shechita
Colorado State University
Compassion in World Farming
Danish Crown
Danish Meat Research Institute
European Ostrich Association
Farm and Food Society
Farm Animal Care Trust
Food Standards Agency
Halal Food Authority
Humane Slaughter Association
Licensed Animal Slaughterers and Salvage Association
Livestock Auctioneers Association
Local Authorities Co-ordinating Body on Food and Trading Standards
Macaulay Land Use Research Institute
Marks and Spencer plc
Meat Hygiene Service
Meat and Livestock Commission
National Animal Welfare Advisory Committee, New Zealand
National Council of Shechita Boards
National Farmers Union
National Federation of Meat and Food Traders
National Sheep Association

Romford Wholesale Meats Ltd
Roslin Institute
Royal College of Veterinary Surgeons
Royal Society for the Prevention of Cruelty to Animals
Scottish Association of Meat Wholesalers
Scottish Centre for Animal Welfare Studies
Scottish Society for the Prevention of Cruelty to Animals
Silsoe Research Institute
Small Abattoirs Federation
Temple Grandin
Tesco Stores Ltd
Union of Muslim Organisations
Union of Orthodox Hebrew Congregations
Universities Federation for Animal Welfare
University of Bristol
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Vegetarian Economy and Green Agriculture
Vegetarians International Voice for Animals
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APPENDIX C

GLOSSARY

Animal Welfare Officer (AWO) -	person having undergone recognised formal training in animal welfare.
Ante-mortem inspection -	inspection by the OVS of live animals in the slaughterhouse.
Bleeding/bleeding out -	release of blood from the slaughtered animal.
Captive-bolt stunning -	stunning by the use of a hand-held pistol to drive a bolt into the brain.
Carotid arteries -	major blood vessels supplying blood to the head.
Code of Practice -	set of recommendations or guidelines of good practice which may have statutory backing.
Con-specifics -	animals of the same species.
CPD -	Continuing Professional Development
Culling -	killing of surplus animals.
Curtilage (of slaughterhouse) -	the area within which the slaughterhouse and its associated lairages and yards are situated.
Death -	the cessation of the vital functions of an animal
DVM -	Divisional Veterinary Manager, employed by the SVS to manage animal health staff by region.
Electrical stunning -	stunning by the use of electrical current across the brain via electrodes applied to the head.
Electrode -	the positive or negative terminal which is used to conduct an electric current into the body.
Electroencephalographic methodology -	method for analysing electrical activity in the brain.
Exsanguination -	the loss of blood from the body.
FSA -	Food Standards Agency, with responsibility for meat hygiene regulations.
Goad -	a blunt or pointed stick, or battery operated electric baton, used to urge animals to move.
Halal -	Muslim method of slaughter.
Isolation pen -	facility to isolate injured or diseased animals on arrival at the slaughterhouse.
Jugular vein -	major blood vessel draining blood from the head.
Killing -	causing the death of the animal by any process other than slaughter.
Knackermen -	a private slaughterer or collector and processor of animals, the meat from which are not intended for human consumption.
Lairage -	a place (a building or field) where livestock are kept while awaiting slaughter.
Marksmen -	person highly trained in the use of firearms.
MHI -	Meat Hygiene Inspector, non-veterinary meat inspector provided by the MHS.
MHS -	Meat Hygiene Service, with responsibility for enforcement of meat hygiene and animal welfare regulations in the slaughterhouse.
Neck cut -	severing of the major blood vessels in the neck.
NVQ -	National Vocational Qualification.
Occlusion -	blocking of severed blood vessels.
On farm slaughter/killing -	slaughter or killing of animals, which may or may not be for human consumption, on the farm premises.

OVS -	Official Veterinary Surgeon – a veterinary surgeon appointed by the Meat Hygiene Service to carry out inspection of live animals before slaughter and to examine the slaughter process for purposes of protecting animal welfare and meat hygiene.
Pig board -	handling aid mainly used for guiding pigs.
Pithing -	the insertion of a rod through the hole made in the head by the entry of the captive-bolt to destroy the hind part of the brain (no longer permitted where meat is for human consumption).
Race -	a passageway along which livestock may be moved.
Ratites -	large birds such as ostrich, emu, etc.
Restrainer/conveyer -	a conveyer that holds the animal still and presents it for stunning.
Roll-out -	action of removing animal from stunning box.
Shackling -	attaching fastenings (shackles) to the stunned animal (usually by the hind legs) by which it can be winched up and hung for sticking and bleeding.
Shechita -	Jewish method of slaughter.
Slaughter -	causing the death of the animal by bleeding
Slaughterhouse -	licensed premises where animals are slaughtered and carcases prepared for sale for human consumption.
Slaughter line -	a conveyer system for moving a carcase through the slaughter hall.
SNVQ -	Scottish National Vocational Qualification.
Stunning -	rendering unconscious and insensible to pain.
SVS -	State Veterinary Service, whose responsibilities include control of animal disease and animal welfare. These official veterinary surgeons are employed by the Department for Environment, Food and Rural Affairs.
Technology transfer -	the act of conveying results of research and development to interested parties.
Tongs -	structure used to carry electrodes in electrical stunning facilitating application to head or body.
Thoracic stick/sticking -	severing major blood vessels anterior to the heart by means of a knife.
Throughput -	number of animals processed by a slaughterhouse in a particular period.
Vocalisation -	vocal noises made by animals.
WASK -	Welfare of Animals (Slaughter or Killing) Regulations 1995.

APPENDIX D

ANIMAL WELFARE AT SLAUGHTER – MONITORING AND ASSESSMENT SYSTEMS

Throughout this report FAWC has made references to the use of objective measurements of animal welfare parameters. There are a number of measurements that are relatively quick and simple to carry out, that have practical applications and are in use.

Number of animals slipping or falling

This is a good indicator of the condition of the floor and evidence of the provision of a non-slip surface. Over zealous driving of animals may also be a cause. Scoring is most useful in critical areas of the system: at unloading, major passageways and turns within the lairage, crowd pens, pre-stun races, restrainer entrances, stunning boxes, and group stunning pens. This measure is relevant to all species. Several groups of animals should be scored at the same time, e.g. 50 cattle, 100 pigs or sheep. The scoring systems set out below are suggestions of best practice.

SCORE	DEFINITION
Excellent	No slipping or falling
Acceptable	Slipping of less than 3% of animals
Not acceptable	1% falling down (body touches the floor)
Serious problem	5% falling down or 15% or more slipping

Number of animals goaded or hit

Goad use is most prevalent within crowd pens, pre-slaughter handling races and at the entrances to a stunning box or restrainer/conveyer. The use of electric goads at unloading, within the lairage and on sheep should not be necessary. Use of goads may be indicative of poor handling design or habituation of staff.

Electric goad use for cattle

SCORE	Crowd pen or race	Entrance to stun box	Total
Excellent	None	5% or less	5% or less
Acceptable	5% or less	20% or less	25% or less
Serious problem			50% or more

Electric goad use for pigs

SCORE	Crowd pen or race	Entrance to stunner restrainer	Total
Excellent	None	10% or less	10% or less
Acceptable			25% or less
Serious problem			50% or more

Vocalisation of cattle and noise levels for pigs

Cattle have been shown to vocalise in response to an 'unacceptable' event, for example goading, slipping, restraint and separation from others. It is normal for cattle to vocalise within the lairage so this area should not be scored. It is important to score different groups of cattle from different producers.

Vocalisation levels of cattle in crowd pen, race stun box, restraining device or crush

SCORE	DEFINITION
Excellent	0.5% or less of cattle vocalise
Acceptable	3% or less of cattle vocalise
Not acceptable	4-10% of cattle vocalise
Serious problem	Over 10% of cattle vocalise

As pigs are by nature vocal animals a more objective measure is to record overall noise levels with a sound meter. Average noise readings recorded for pigs in the lairage are between 74-90 dB(A). In the handling system noise levels are between 88-99 dB(A). Maximum readings in handling systems have ranged from 105-120 dB(A). Levels of 90dB(A) require staff to wear appropriate ear protection at all times. Noise levels for pigs should be measured at set points in the system, over a number of producer batches and different times of the day.

Vocalisation scoring and noise level measurement are not useful welfare monitoring tools for sheep.

Behaviour of the animals

Assessing the behaviour of the animals is a more difficult technique and will take some time to get used to recording. Behavioural measures do help to identify those parts of the system which are effective and non-effective from the animals point of view, i.e. a general idea of how easily animals move through the system.

Choose a point within the system, such as a race way or entrance point to the stunning box or restrainer and record the events for each animal. This information can be combined with scoring slipping, falling, goading and individual vocalisation (cattle only) if the assessor is familiar with the techniques.

Effective behaviours indicate that the animals are moving well through the system and include walking forward, waiting, using steps, and slowing down.

Non-effective behaviours indicate that animals are not moving well through the system and include stopping, refusal, balking, jamming, reversing, jostling, pacing and turning.

Defecation or urination by animals in the handling system can also be noted as these are also indicators of potential distress in these areas.

Non-effective behaviours are usually displayed due to an ‘hazard’ in the handling area, for example animals may jam because a raceway is too wide, they may stop or refuse because of a solid surface or change in light patterns.

A high percentage of non-effective behaviours will identify a problem in the system that needs rectification. Any changes should be made one at a time followed by another assessment. In this way it is possible to make positive progress. Changing several design features at once carries a risk that if assessment shows no change then it is difficult to identify the changes that may have worked and those that did not.

APPENDIX E

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