
UNIT 15 ANIMAL WELFARE AUDITING

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15.1 LEARNING OUTCOMES

- a) Knowledge and Understanding :** When you have studied this unit, you will be able to:
- Understand why formal animal welfare standards and auditing programmes have been developed, by animal users and other stakeholders, nationally and internationally.
 - Recognize different approaches used in welfare assessment and auditing and the strengths and weaknesses of such approaches.
- b) Practical and Professional Skills :** When you have studied this unit, you will be able to:
- Discuss the important examples of standards, auditing and humane certification.
 - Summarise different practical requirements for setting up auditing and certification, including training and certification of auditors.

15.2 INTRODUCTION

Dear Learner,

In previous Units we have discussed how, in recent decades, the use of animals has grown:

- More than 70 thousand million farm animals (birds and mammals) are reared worldwide each year, and
- A similar number of fish, as well as millions of laboratory, working and pet animals.

There is great variation both in their welfare and in how concerned people are about animal welfare, but concern has generally increased, if unevenly over this period. A key principle in our interactions with all these animals is mutual benefit: many improvements to animal welfare are also beneficial for people. However, although the interests of humans and animals overlap, they do not overlap completely. Furthermore, there have been developments both in how animals are treated (such as industrialisation of livestock farming) and in social circumstances (such as increasing affluence of some people) that affect attitudes to welfare. So some people have introduced ways of safeguarding or improving welfare, either for animals with which they are directly involved (for example, those supplying them with food) or for all animals of a certain kind in an area or a country or even worldwide. Those ways include legislation, and other programmes of animal welfare standards. In the previous Units we have discussed how and why we might want to assess animal welfare, and how schemes to allow these to be assessed might be developed. In this Unit we will look at what types of schemes are available and how these are being applied in different contexts, using some specific examples in different types of animal use, to impact on animal welfare.

15.3 WHY CONDUCT WELFARE ASSESSMENT / AUDIT?

In the last Unit we considered that animal welfare might be assessed or audited for a number of specific reasons:

- 1) For ensuring compliance with minimal standards (often compliance with legislation);
- 2) For assessing the level achieved against a welfare bench-mark in an enhanced welfare scheme;
- 3) To check on the welfare impact of a change in management;
- 4) To achieve continuous improvements in welfare.

Let's look at each of these in more detail, and consider what sort of assessments or auditing processes might be required.

15.3.1 Compliance with Minimum Standards

In many countries, the minimum permitted standards of animal welfare are defined by legislation. This might be anti-cruelty laws, or other legislation that defines the lowest possible standards of animal welfare.

- *Example 1:* In India, the Prevention of Cruelty to Animals Act in 1960 was designed to prevent the infliction of unnecessary pain or suffering on animals, except in the manner of killing prescribed by religion.
- *Example 2:* In the UK there have been several laws that have prevented various acts of cruelty toward animals such as the Protection of Animal Act in 1911, which specifically outlawed the 'fighting or baiting of animals', and more recently the Animal Welfare Act of 2006, which defined that animal keepers have a duty to care for their animals and to provide for their welfare needs, including farm and pet animals.

In some countries, this may also be supplemented by Codes of Practice, either defined by governments or their advisors, or by industry bodies, which provide more detail about the permitted practices or management of specific groups of animals within that country. An example of the difference between the law and a Code of Practice for dogs in the UK is given in Box 15.1.

Box 15.1: Code of Practice for the Welfare of Dogs

To meet the welfare need for a suitable diet (a legal requirement under the Animal Welfare Act 2006), the Codes of Practice recommends what the owner should do:

- Provide your dog with clean fresh drinking water at all times. If necessary carry water, in a suitable container, with you when clean water is unlikely to be available.
- Make sure your dog eats a balanced diet suitable for their individual needs and maintains a stable weight that is neither over nor underweight for their age, level of activity, sex, breed and state of health. Do not let your dog overeat or they will become obese, and do not feed too little or your dog will be underweight.
- Be aware that any change in the amount your dog eats or drinks may be a sign of ill health. If your dog's eating or drinking habits change, consult your vet.

- Read, and be guided by, the feeding instructions relating to any dog foods you buy but adjust so that your dog does not become over or underweight.
- Provide all dogs (including puppies) that have special needs with diets that meet their individual requirements.
- Feed your adult dog at least once each day, unless advised otherwise by your vet.
- Do not change your dog's diet suddenly. Changes should be made gradually over several days.
- You should not feed your dog shortly before, or after, strenuous exercise.
- If you are uncertain what to do you should seek advice on feeding your dog from a vet, veterinary nurse or other reliable source.

Source: Code of practice for the welfare of dogs:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697953/pb13333-cop-dogs-091204.pdf

Legal requirements to avoid animal cruelty often do not need specific welfare assessment schemes in order for these to be enforced. Cruelty can often be overt and clearly demonstrated to be associated with animal suffering and thus cruel treatment, such as beating, over-loading or starving animals may be clearly associated with poor animal welfare. However, compliance with more prescriptive legislation, or meeting requirements of Codes of Practice, may need more robust and complex welfare assessment schemes. The Welfare Quality welfare assessment schemes, as mentioned in Unit 14, were designed to be used to assess compliance with EU legislation on animal welfare, and in several countries there are systems of checking, inspections and audits, at least for farm and zoo animals. For pet or companion animals, this may rely on a veterinarian to identify that, for example, a dog or cat is obese or underweight and to suggest corrective actions.

15.3.2 Welfare Benchmarks in an Enhanced Welfare Scheme

As previously discussed, there are many systems in place, provided by retailers or certification bodies, that wish to charge higher prices where there is a market for enhanced animal welfare. This may also be a benchmark that recognizes an establishment (a zoo or equine facility for example, or other animal keeping establishment) has met some form of accreditation. For these schemes some form of inspection or audit is often required to ensure that the establishment is providing the level of care and welfare that the scheme requires.

- *Example 1:* The Royal Society for the Prevention of Cruelty to Animals: RSPCA- Assured mark in the UK (Box 15.2)
- *Example 2:* The Global Animal Partnership (GAP) certification in the USA (and elsewhere) for food animals (Box 15.3).

Box 15.2: What Makes RSPCA-Assured Bacon Different?

Bacon which carries the ‘RSPCA Assured’ logo comes from farms where the pigs had better lives like the opportunity to express their natural behaviour, plenty of space to move around in, material such as straw they can root about in, and also a comfortable place to sleep.



Source: <https://www.rspcaassured.org.uk/farm-animal-welfare/pigs/>

Box 15.3: Global Animal Partnership (GAP) Certification

GAP uses independent, third-party certifiers to audit farms and verify compliance to comprehensive welfare standards and assign appropriate animal welfare certification level. These standards are to be maintained until next audit (15 months).

Source: <https://globalanimalpartnership.org/certification/>



Specific requirements are laid out in these Certification systems, generally, but not necessarily, following the scientific literature to ensure that requirements are related to improvements in animal welfare. For example, the RSPCA Assured standards for laying hens requires:

- That hens are never kept in cages
- That hens are provided with objects to peck at, such as knotted ropes and straw bales
- That litter and dust bathing boxes are provided which allow hens to dust bathe together
- That raised perches are provided to allow hens to rest undisturbed.

You will notice that these requirements are largely about the sorts of resources that must be provided to laying hens, and the scheme also has information about the size of pens and the numbers of animals per enclosure or feeder etc. If we were to audit this scheme we could largely make use of resource-based measures to check that hens were indeed never housed, and were provided with peckable objects, dust-bathing boxes and perches as part of an inspection. Similar schemes and methods of audit are also available and in use in other countries and for other animal systems other than farmed animals. Overall, these would allow the retailer or the scheme owner to assess that the farmer was compliant with their scheme, and therefore were able to use the Certification symbol or mark on their product. As a consumer of products, we would also be reassured that the farm was meeting the requirements of the scheme, and we may then be willing to pay more for these products if that was important to us.

15.3.3 Assessing the Welfare Impact of a Change in Management

The previous two reasons for assessing animal welfare are used by external agents, which might wish to assess someone or a facility to assess welfare standards. However, an animal keeper may also wish to assess welfare themselves, as part of their ongoing animal management. This might be particularly the case if animal management has changed and the impact on animal welfare may need to be understood. Examples of when a welfare scheme might be useful could be:

- When introducing new animals into an enclosure or established group of animals in a zoo
- Changing animals from a housed to an outdoor environment (e.g. such as at the end of winter)
- Providing a treatment for an on-going health issue
- Implementing a change in building design or resource provision to meet the needs of a retailer scheme.

Many of these changes may be designed to improve welfare, but might have unintended consequences on other animals in the social group, or on other aspects of welfare other than that which is under investigation. Monitoring and assessing all aspects of welfare can help the animal keeper keep track of any changes in welfare, and to understand if improved management has improved welfare, or to understand why a proposed change may not be having the desired effect.

15.3.4 Continuous Improvements in Animal Welfare

In practice, many animal keepers may already assess welfare routinely as part of their animal husbandry, perhaps on an *ad hoc* basis. A good animal keeper will know the normal health and behaviour of their animals, and may check daily that the animals are well, sound and engaging normally with the environment and other animals. However, it is easy for poor welfare to become normalized for animal keepers who are used to the behaviour, appearance or health of their own animals, and rarely spend time with the animals of others. Under these conditions animals that are too thin, for example, or have altered gait indicative of lameness, may become the new normal for the animal keeper, and this ceases to be something they notice. With a large group of animals, it is sometimes easy to focus on the animals that are doing very well, and less successful animals may be ignored or overlooked without a fixed scheme to assess all animals. Finally, an animal keeper might become complacent or relaxed about the welfare condition of their animals, and may not continually strive to improve welfare. Thus, assessing and monitoring welfare can be important for all animal keepers to allow continuous improvements to be made.

For the conditions described in sections 15.3.3 and 15.3.4, a complete welfare assessment scheme may not necessarily be required. However, it is important to have a method for assessing welfare, such as body condition scoring, assessing feather cover in birds, assessing gait score or other measures that can be made consistently and in the same way over time for welfare to be assessed properly. It is also important that records are kept. It is often said that '*you cannot manage what you do not measure*'. As humans we often do not remember nearly as well as we like to think, and it is very easy to imagine that our animals have stayed the same or improved over time, but without the records we cannot know this for

sure. In some schemes, such as those discussed in sections 15.3.1 and 15.3.2, the ability of the animal keeper to keep good records of animal welfare can be used as a way to reduce the frequency of external inspections and audits, if it can be demonstrated that welfare is being regularly and accurately recorded.

Before we proceed, please complete activity 1.

Activity 1: Talk to various stakeholders about the need for formal animal welfare standards and auditing programmes. Compare their responses to the discussion given in the section and write your observations:

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Check Your Progress 1

Note: a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) What are the specific reasons for animal welfare assessment / audit?

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2) How are legal requirements and welfare assessment schemes linked?

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3) What do you mean by welfare benchmarks in an enhanced welfare scheme?

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4) Write the requirements for laying hens in RSPCA assured standards

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5) Write the examples for assessing the welfare impact of a change in management.

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6) What is the significance of record keeping in welfare assessment?

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15.4 IMPLEMENTING ANIMAL WELFARE ASSESSMENT

In this section we shall consider the steps needed to implement welfare assessment in practice, and some of the issues involved. Although we will focus predominantly on the methods and issues used by outside agencies to assess welfare and audit an animal facility, a similar, but perhaps simpler, process could be carried out by any animal keeper in assessing the welfare of their animals for continuous improvement of welfare.

The various steps in implementing animal welfare assessment are:

- 1) Measurement
 - Sampling
 - Individuals vs Group Assessment
 - Impact of Time of Day
 - Impact of Season or Time of Year
 - Types of Inspection Visit
 - Types of Assessor

- 2) Analysis and Scoring
 - No Formal Aggregation
 - Checklists
 - Sums of Ranks
 - Sums of Scores
 - Weighted Sum of Scores
- 3) Informing and Feedback
- 4) Improving Animal Welfare

Let us discuss them briefly with relevant examples.

15.4.1 Measurement

The first step in the process is to make measurements that will allow welfare to be assessed in a fair and unbiased manner. As described in Unit 14, to do this we need to identify welfare indicators that are:

- Valid
- Reliable
- Feasible, and
- Appropriate for the species, system and purpose.

The welfare indicators should also be selected to provide a multi-dimensional animal welfare assessment such that a comprehensive assessment of welfare can be carried out. In addition to the design of the welfare assessment scheme, we also need to consider a number of other factors, including:

- Can we assess all the animals in a facility and is it practical to do so? If not what sampling protocol will we use to assess a reasonable and unbiased sample?
- Are measures made on individual animals (e.g. body condition scoring) or on the whole group (e.g. lying synchronously), and will handling the animals for individual animal assessments have an impact on other indicators?
- Will the measures be affected by time of day? For example, we might expect to see more fighting or aggression around feeding time, so should this be avoided or considered in our welfare assessment?
- Will the measures be affected by seasonal factors or time of year? For example, if it is very hot and dry will this influence the measures or outcomes we will collect? Are there times of year when we might be more likely to see very young animals, or lactating animals, and will this influence the measures?
- How will the measures be collected? Will this be an ‘announced’ assessment (where the animal keeper knows that an inspection will occur) or will this be a surprise or unannounced visit?
- Who will collect the data – will this be an inspector or auditor who collects all the data during a visit, or the animal keeper who shares their records, or a joint data collection?

These sorts of considerations will need to be included in any assessment or protocol for welfare auditing. We will briefly consider now the possibly impacts of these factors on the possible outcomes, and the advantages and disadvantages of these issues:

15.4.1.1 *Sampling*

It is often not possible to measure all the animals in a facility if the numbers are large (>50 for example). Often we may need to choose a sample of animals that are representative of the whole group. This can be done randomly (choosing any animals), or systematically (by choosing animals in a method defined before arriving at the facility, such as every 3rd animal or taking the same number of animals from the first, middle and last groups presented). Sampling can allow us to assess the animals in a practical period of time, but may mean that we miss some of the more important welfare issues if these are rare, or we may be biased towards the best or the worst animals in a group and so not gain a complete picture of the welfare of the facility.

15.4.1.2 *Individuals vs Group Assessment*

This may depend on our types of measure, as some can only be made on individual animals, and some animals may be kept alone. Assessing individual animals can often give us a more complete picture of some aspects of the welfare of that animal (such as health status), although this often requires handling the animal, and this may prevent us assessing other indicators such as behaviour. This may be an issue if the animals need to be gathered and caught for the assessments, and this may affect behavioural responses before or afterwards. For zoo animals, or other conditions where handling animals may be dangerous or impossible, then the sorts of indicators we can measure may be limited, and only group assessments may be feasible. An advantage of group assessment, if this is the normal condition of the animal, is that this can allow us to see the usual coping of the animal in an undisturbed state.

15.4.1.3 *Impact of Time of Day*

Many animal responses are circadian, that is they are affected by time of day. For example, animals may feed, rest, play or perform other activities at specified times of day. In addition, animal management might be carried out at particular times, for example animals are often fed at proscribed times of day. If these changes will influence the measures, or indeed our ability to make the measures, then whether inspections can only be carried out at specific times needs to be considered in the welfare assessment.

15.4.1.4 *Impact of Season or Time of Year*

Animals may also show seasonal changes in behaviour (for example when entering breeding condition), voluntary feed intake and fatness depending on feed availability. These may not affect our ability to make the required measures, but could influence the frequency with which we might see animals in good or poor body condition, or some other measures. It would not then be reasonable to compare between facilities if some were measured in the good season and others in poorer conditions. However, there may be implications for animal welfare if animal keepers are unable to manage well at certain times of the year, and thus

this might be useful information. At certain times of year we may also be more likely to see very young animals, or lactating females. Although this may not invalidate an inspection it may also influence the types of measures that can be recorded, and potentially the inferences we might draw from the measures.

15.4.1.5 *Types of Inspection Visit*

Visits may be announced, where the animal keeper knows that an inspection will occur, or unannounced, or ‘surprise’, visits. The advantage of the former is that, if inspection of records is required, then these can be prepared in advance, and that someone is present to meet with the inspector. Of course, this might also mean that the animal keeper could change conditions in the facility to give a better impression for the inspector, such as providing more or better quality bedding. In practice, however, it can be difficult to do this if very significant changes are required to improve welfare, and animal-based measures of welfare may not be influenced by short-term changes. The advantage of unannounced visits is that the inspector will see the facility in its ‘normal’ state, and can assess what the normal living conditions for the animals are.

15.4.1.6 *Types of Assessor*

Often assessments are made by a trained auditor or inspector who will collect all the data that form part of the welfare assessment. Although this can ensure consistency between different facilities, and may make comparisons between different establishments or inspections more robust, this can only be a ‘snapshot’ of the welfare of the animals on the day of the visit. For resource-based measures, of course, this will not matter as these are unlikely to change very much from one day to the next, but this can potentially affect the assessment of animal-based indicators. Inspection of the records taken by the animal-keeper can be an alternative strategy, which might allow a more long-term picture to emerge, but this may be open to either deliberate or inadvertent misrepresentation by the animal-keeper. A halfway house can be where the inspector and animal-keeper make some measures together and compare outcomes, which can be a useful way of auditing the animal-keepers records, and providing a basis for discussion around animal welfare.

15.4.2 *Analysis and Scoring*

Once measurements have been collected, then some analysis, or aggregation of the measures is usually required. This may be to ensure that farms or facilities have met the minimum requirements – for example if the standards state that the animals must have a particular length of feeder or access to particular resources then this can be a simple checklist to record whether this has occurred - or a more complex calculation to provide an overall assessment of the unit. Often a comprehensive welfare assessment requires collection of a number of measures and these usually require some ranking, calculations or weighting of the information to reach a final outcome. There are number of different ways that measures can be grouped or analysed that will now be briefly considered.

15.4.2.1 *No Formal Aggregation*

Here the raw data collected on farm is used to produce a report that is based largely on expert opinion. This has the advantage that this can be done very

quickly and does not require any calculation. However, this cannot be standardized between facilities and if many measures are collected this can be difficult for the expert to understand all the measures easily. However, where there are few animals or where the animal-keeper is collecting data for their own assessments, then this can be very useful.

15.4.2.2 Checklists

This is clear and simple, allows the auditor to assess each measure against the minimal requirement and can be easily standardised. The disadvantage of this approach is that all measures are considered to have the same importance, which may not necessarily be true for the animal, it yields a simple yes/no response and does not allow comparisons between farms/facilities. However, this sort of analysis is routinely used to check that legislation is being complied with, or that the strict requirements of certification schemes are being met.

15.4.2.3 Sums of Ranks

This is another simple and clear method but requiring a little more calculation, and allows comparisons between farms or facilities. The ranks of farms or establishments for a set of measures is calculated, and then the sum or mean of these rankings can determine the position of the farm overall, or for each of the ranked measures. This can be useful in providing an ordering of facilities within a group, but, as with the checklist, assumes that all measures are equally important for animal welfare. The ranking for farms can act as an incentive for farmers low in the ranking to endeavor to improve, although this does not always lead to an overall improvement in welfare only a re-ranking of the overall order.

15.4.2.4 Sums of Scores

This is commonly used in welfare assessment and produces absolute values, rather than the relative values of using rank order. Firstly raw data (such as weights, body condition score points or percentage of animals affected by disease for example) need to be converted into a common numerical score, which can then be summed to give an overall score, or a mean score for each Freedom, Domain or welfare criteria. As with the other methods of aggregation mentioned so far these assume that each measure is equally important, although when aggregated within a Freedom or criteria this only provides an assessment at this level. An advantage of this approach at the level of a Freedom, is that it is not necessarily considered that there can be compensation between different measures (for example, if animals are generally in good body condition score but many animals are lame, does this score more highly than a farm with poorer average body condition score but where fewer animals are lame?). In addition, when suggesting ways to improve (see section 15.4.4), this can help to identify where most attention should be applied to improve animal welfare.

15.4.2.5 Weighted Sum of Scores

This is the most complex method of analysis, but can be relatively intuitive and allows an overall absolute score for any farm or facility to be produced. In addition to the scoring approach outlined above, a weighting or value factor is used to provide an importance weighting to each measure in terms of the likely impact on animal welfare. The disadvantage of this method can be that compensations

are allowed between measures, and this can mean that a number of small positive welfare measures could overcome a significant large deviation from good welfare. Without access to all the data it can also be limiting to understand where effort should be put to improve welfare. However, this method can lead to a more sensitive response than the checklist approach above, and can allow between farm comparisons and assessment of compliance with certification schemes.

15.4.3 Informing and Feedback

An important part of the welfare assessment process is to provide information on the outcome of the procedure and how well the facility has scored. This can be used to help explain why a facility may, or not, have achieved the level required for certification or other level of assessment and to provide information to allow changes to be made to improve welfare. The method used to provide the feedback is often influenced by the methods used to aggregate information and provide the ranking or score for the facility. For simple aggregation, the animal-keeper may be provided only with a report and expert opinion based on the raw data collected on their facility. Although this does not provide any comparison to other facilities if a good relationship exists between the animal-keeper and the expert providing the feedback, then this may be sufficient for improvements to be made. An example for this might be feedback from a veterinarian to an owner who may have only a few animals and where changes can be easily identified from the raw data, such as the need to worm animals or reduce feed intake and increase exercise in the case of obesity. For feedback on checklists or rank order then providing coloured charts or red-amber-green ratings can be a useful visual method to rapidly identify areas where facilities are doing less well. These can be simple and clear methods to focus attention on key areas for improvements. An example of the use of this sort of feedback might be for a retailer scheme where a number of farms are providing products to a supermarket. The assessor can rapidly provide clear, visual information on areas that a farm may need to improve to be able to continue as a supplier for this retailer.

For more complex systems it may be that the farm or facility might fall into a bracket which describes whether the farm has achieved a particular status. For example, within the Welfare Quality® welfare assessment procedure farms are classified as:

- **Excellent:** The welfare of the animals is of the highest level
- **Enhanced:** The welfare of the animals is good
- **Acceptable:** The welfare of the animals is above or meet minimal requirements
- **Not classified:** The welfare of animals is low and considered unacceptable

In all cases the feedback should be objective and provide the recipient with a clear explanation of how they have passed or failed the criteria, and should be used as a means to support improvements in animal welfare. How this might be achieved will now be discussed in the next section.

An example of how these relate to the aggregated scores for farms is shown in Box 15.4.

Box 15.4: Examples for farms in the four Welfare Quality® categories

Source: http://www.welfarequalitynetwork.net/media/1088/cattle_protocol_without_veal_calves.pdf

15.4.4 Improving Animal Welfare

An important goal of welfare assessment should be to provide learning opportunities, advice and the option for improvements in animal welfare, followed by reassessment. There are several ways that welfare improvements can be achieved, such as:

- Legislation and penalties or sanctions
- Advice and recommendations
- Animal-keeper training programmes
- Welfare-friendly selection criteria for future breeding programmes.

Where facilities have failed to meet even the minimum standards for animal welfare, and the animal-keeper has been resistant to change or unwilling to implement advice, then applying penalties, such as those for animal cruelty offences, and perhaps sanctions such that they are unable to keep animals, may be the only option. However, where possible, provision of advice on housing and husbandry, and support to allow these to be implemented, can be better options to improve welfare, and the livelihoods of those reliant on them. An advisory service or function, either through established veterinary networks or by other means, can be very valuable to provide up-to-date information to animal-keepers and recommendations on how things can be improved based on the growing scientific evidence (as you are learning in completing this course). In some cases provision of practical training in specific aspects of animal welfare can be beneficial, such as low stress handling or animal behaviour, and can help animal-keepers to see what might be possible. Other methods for improving animal welfare will be explained and explored more fully in the following Units in this block.

Before we proceed, please complete activity 2.

Activity 2: Reflect on your own view of welfare assessment in practice, and some of the ways that measures can be ‘grouped or analysed’. Which way of grouping or analysing is most important for you? Discuss them with friends

or colleagues to see which measure of grouping or analysis is most prevalent and write your observations:

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Check Your Progress 2

Note: a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) How do you select indicators to measure welfare in a fair and unbiased manner?

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2) What are the factors to be considered in welfare assessment?

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3) Write the merits and demerits of announced and unannounced welfare assessment visits

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4) Name four ways through which welfare improvements can be achieved.

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15.5 ANIMAL WELFARE ASSESSMENT SCHEMES OR PROTOCOLS

There are already a considerable number of animal welfare assessment protocols or schemes in existence that are in routine use to assess animal welfare for various purposes. In this section we will briefly discuss the key features of some of these for the different types of animals to which they apply under the following heads:

- 1) Farm Animals
- 2) Animals in Zoos and Aquaria
- 3) Laboratory Animals
- 4) Other Species, including Pets

15.5.1 Farm Animals

Methods for assessing the welfare of animals kept on farm have been subject to the most scientific investigation and this is where the greatest number of schemes are. This is largely because, as stated in the introduction, this can also be where there is the greatest mismatch between animal welfare benefits and human benefits, so the area where it is more likely for animal welfare to suffer. There are essentially two types of welfare assessments available for farm animals:

- 1) Retailer or certification specifications
- 2) Overall welfare assessment schemes

Retailer or certification specifications are those that allow the use of a specialized animal welfare mark (such as RSPCA-Assured as discussed above) or allow a supplier to provide animal products to a specific market. These are often based on compliance with a list of resource-based measures, for example focusing on the living, feeding and management conditions of the animals such as:

- Amount of space each animal should have and the size of the social group
- The types of bedding available, amount of light and dark that animal should be exposed to
- When and what sort of procedures can be done to the animal (e.g. weaning, tail-docking etc) and what are the permitted methods
- Availability of species specific resources (such as nest sites, enrichment objects etc)
- Frequency of feeding or specific access to types of feed (for example provision of roughage for ruminant animals)
- Any permitted or forbidden practices (such as with-holding food for periods of time, or periods of confinement)
- The maximum journey time to slaughter

In general, because of the large amount of scientific research conducted on farmed species, many of these requirements should be based on a scientific understanding of animal needs and related to practices that will provide good welfare for animals, or minimize the risks of poor welfare. However, these schemes do not measure welfare state itself, instead they assess risks for poor welfare and opportunities

for good welfare. In addition, some of these schemes may also include a number of animal-based measures that may focus on specific health or behavioural characteristics known to occur in a particular species, such as incidence of gait abnormalities or lameness in dairy cattle or pigs. There are also other schemes where animal welfare characteristics may be part of a suite of other measures, for example for organic certifications. In these cases there may also be restrictions on where animal feeds can be acquired, and the use of particular medicines may also be restricted or limited. Some examples of different Certification schemes are given in Box 15.5.

Box 15.5: Animal Welfare Certification Schemes Available In Various Countries

RSPCA-Assured (UK-based scheme): This provides certification for a number of sectors including dairy cows, meat and egg laying chickens, pigs, salmon and trout, turkeys, veal calves, sheep, beef cattle and for transport and slaughter. Standards are based on providing more space, natural lighting, comfy bedding, environmental enrichment and shade and shelter. Farms that meet the standards can use a specific mark, and their products tend to attract a higher price. For more information see: <https://www.rspcaassured.org.uk/farm-animal-welfare/rspca-welfare-standards/>

Beter Leven (Dutch scheme: The Better Life Label): Owned by the Dutch Society for the Protection of Animals (SPA), this is a tiered welfare system based on 1 star (regular farming plus requirements to improve the most important welfare issues per animals species), 2 star (outdoor access and many welfare issues are resolved) and 3 star (organic systems with higher welfare). For more information see: <https://beterleven.dierenbescherming.nl/zakelijk/english-info>

Global Animal Partnership (USA based but available globally): A tiered Animal Welfare Certification process, which allows producers to join at a lower level and move up the scale when they meet higher standards. The tiers are based on provision of an enriched environment, allowing outdoor access, raising animals at pasture, animal-centred management and animals living their entire lives on the same farm. Producers that meet the specifications can use a particular mark indicating their achievements, and their products may attract a higher price

For more information see: <https://globalanimalpartnership.org/standards/>

Certified Humane® (USA-based scheme): This provides standards and certification for animal care and slaughter for all major farmed species including goats (for fibre as well as meat and dairy), bison and red deer. Their standards are provided in French, Spanish and Portuguese as well as in English. For more information see: <https://certifiedhumane.org/how-we-work/our-standards/>

Soil Association (UK organic scheme): This provides farm assurance via the AssureWel umbrella. This was a collaborative effort between RSPCA, Soil Association and University of Bristol, UK. Farm assurance standards are available for laying hens, dairy cows, pigs, broilers, beef cattle and sheep. For more information see: <http://www.assurewel.org/index.html>

Overall animal welfare schemes are those that are not directly associated with a standard or Certification mark, and are designed to assess compliance with legislation or to assess farm animal welfare under other circumstances. A number of scientific studies have suggested a range of different measures, alone or in combination, for assessing animal welfare for different farmed species, and more widely available protocols have also been produced. Examples of these are the protocols that have been developed in the EU and consist of the Welfare Quality® protocols for cattle, pigs and poultry (developed following a large multi-country research project between 2004 and 2009 involving EU and Latin American institution) and the Animal Welfare Indicators (AWIN) protocols for sheep, goats, horses, donkeys and turkeys (developed following a second EU-funded project from 2011 to 2015). These protocols use the Welfare principles and criteria you have already learned about in previous Units, and, unlike the farm assurance and certification schemes, focus almost exclusively on animal-based indicators rather than resource-based measures. In addition, the EU has also provided guidance and assessment methods for the transport and slaughter of farmed animals. Further specific information on these different protocols is given in Box 15.6.

Box 15.6: European Outcome-based Welfare Assessment Protocols for Farmed Animals

The Welfare Quality® project has produced welfare assessment protocols for cattle, pigs and poultry. These are comprehensive protocols that assess a large number of indicators and, using a weighted scoring and summing system, can provide a single score for a farm. These protocols are the outcome of a large project which assessed a number of indicators for validity, reliability and feasibility in developing the protocols. For more information about the project, and to access the protocols which are freely available, follow: <http://www.welfarequalitynetwork.net/en-us/reports/assessment-protocols/>

The Animal Welfare indicators project has produced welfare assessment protocols for sheep and goats, horses and donkeys and for turkeys, using the frameworks developed by the Welfare Quality project. The project focused specifically on the assessment of pain, as well developing indicators of welfare for the target species, and many of the protocols were also converted into apps to facilitate on farm data collection. More information about the project can be found here: <http://www.animalwelfarehub.com/home>

And the protocols can be downloaded here: <https://www.ed.ac.uk/vet/jeanne-marchig-centre/cpd/farm-animal-welfare>

(Please refer Block 1: 'Welfare Standards - Dairy Animals' under MAW-004 for more discussion on India's National Dairy Code with 10 welfare criteria)

15.5.2 Animals in Zoos and Aquaria

Among the primary purposes for keeping animals in zoos and aquaria should be conservation and education. Therefore, it could be assumed that animal welfare would be an important goal of these establishments. However, zoos and aquaria usually need to make money to survive through attracting the public to pay to enter the zoo. Thus, sometimes these objectives (of entertainment) may become more important than the welfare of the animals. For example, zoos may wish animals to be visible during the daylight hours when visitors are present, even if

the animals is nocturnal or finds the presence of many noisy visitors very stressful. In other cases, whether zoos or aquaria can meet the animals welfare needs may be challenging (for animals that would roam over very large areas in the wild, for example) or some aspects of an animals welfare needs might simply be largely unknown (such as the nutritional requirements or foraging behaviour of unusual or little known species).

In 2003 the World Association of Zoos and Aquariums (WAZA) developed a Code of Ethics and Animal Welfare to which it expects its members to adhere. So, just as we have described certification principles for farmed animals, WAZA lays down guidance and basic principles for zoos wishing to be members of the organization which explains how animal welfare should be addressed (Box 15.7).

Box 15.7: Views of WAZA on Animal Welfare

- Members of WAZA will ensure that all animals in their care are treated with the utmost care and their welfare should be paramount at all times.
- At all times, any legislated codes for animal welfare should be regarded as minimum standards.
- Appropriate animal husbandry practices must be in place and sound veterinary care available.
- When an animal has no reasonable quality of life, it should be euthanized quickly and without suffering.

As you can see this adopts very similar principles and requirements to farm animal welfare, including that legislation is seen as the minimum acceptable standard of animal welfare, and that quality of life should be the main principles utilized.

Within countries, however, there may be further legislation, inspection and other methods to assure compliance. For example, the Central Zoo Authority (CZA) of India specifies minimum standards for zoos, evaluates these standards and provides zoos with official recognition. Zoo Rules (2009) contains welfare measures for zoo and circus animals in captivity in India. In the EU, member states are required by Directive 199/22/EC to regulate zoos for animal welfare, which is written into law with the provision of Welfare Standards for zoos in 2012 in the UK. Zoos in the UK are then audited by Government appointed zoo inspectors to ensure that these Standards are met. The Standards cover very similar criteria to farm animal welfare assessment protocols, the Five Freedoms or the Five welfare needs. In addition to the general animal standards there are specific requirements for some types of animals, in particular for elephants, and specific assessments of the ability of elephant-keeping zoos to meet their welfare needs. Zoos are then audited regularly, via the zoos inspectorate, for their record keeping and animal husbandry practices. Unlike the farm animal welfare assessments these assessment rely mainly on the expertise of the trained zoo inspector (usually a veterinarian) to make the welfare assessments, checking for adherence to the zoo standards. For an example of zoo standards, see Box 15.8.

**Box 15.8: An Example of Zoo Welfare Standards from the UK
(Following Legislation Developed in 2012)**

Section 1 – Provision of food and water: Covering how and what type of food can be provided to animals, taking into consideration hygiene and the natural behaviour of the species. Live feeding of vertebrate prey and uncontrolled feeding of animals by visitors is not permitted. Dietary records should be made.

Section 2 – Provision of a suitable environment: Covering the temperature, ventilation, lighting and noise levels of enclosures, hygiene practices and any special requirements of species or life stages (such as for pregnant or lactating females).

Section 3 – Provision of animal health care: Covering how routine observations and daily records must be kept, the size and design of enclosures including social requirements of the species, and the programme of veterinary care required. Facilities for isolation, quarantine and containment are required.

Section 4 – Provision of opportunity to express most normal behaviour: Covering captive breeding, the natural habitat and the physiological and psychological needs of the species (such as opportunities for burrowing, nesting, swimming or wallowing, climbing etc).

Section 5 – Provision of protections from fear and distress: Covering staff training and handling, conditions for direct contact between animals and visiting public (if allowed at all), and special conditions for some animals such as those destined for rehabilitation.

Section 6 – Transportation and movement of live animals: Covering how animals can be caught, housed and transported, and to where animals can be moved or passed on.

Section 7 – Conservation and education measures: Specifies that conservation should be undertaken by zoos, and that zoos must promote public educations and awareness.

Section 8 – Public safety in the zoo: Covering, in addition to issues such as insurance, the needs for enclosures to be properly maintained for the safety of animals and the public, and how to deal with escapes.

Section 9 – Stock records: Requiring the keeping and maintenance of individual and species records to include behavioural and clinical history, birth, deaths and culls.

Section 10 – Staff and training: Specifying the numbers of staff, their competency and training requirements (which includes animal welfare training).

(Please refer the units on Zoo Animal Welfare Issues and Standards under MAW-002 and MAW-004 for more details specific to India)

15.5.3 Laboratory Animals

As with farmed animals, animals kept in the laboratory for research, teaching or testing are at higher risk of poor welfare where the welfare benefits of the animal do not necessarily align with the welfare benefits of humans. For example,

standardization of animals for experiments might mean single housing of social species (such as mice or rats) in very barren environments. However, there is now good scientific evidence that animals with unmanaged pain, or kept in very barren environments, may not give good quality scientific data. This information can help to improve laboratory animal welfare. Welfare assessment of laboratory animals is important from the ethical view of managing animals appropriately, but also to ensure good quality data, and to determine humane endpoints. In many countries, the use of animals in experiments is subjected to legislation, which often includes regular checking and welfare assessment. Specific frameworks to do this do not always exist, although the Five Domains model of animal welfare assessment, which you have learnt about previously, was originally developed for this purpose. However, the assessment of laboratory animal welfare has been specified to include the following six categories:

- Appearance – such as body, coat and skin condition, posture and facial expression
- Bodily functions – such as food intake and changes in temperature
- Environmental measures – such as nest quality and faecal consistency
- Behaviour – such as social interaction, posture, gait and stereotypies
- Procedure-related indicators – such as tumour size in cancer studies or degree of impairment in neurological studies
- Free observations – such as unpredicted indicators of suffering

These indicators are predominantly focused on the impact of that animal of the scientific procedures carried out, and auditing and reporting on these measures is often required by the regulations of the country. Many countries require an Animal Welfare and Ethical Review Board (AWERB) to consider the costs and benefits of the study before experiments can begin, and consideration of three key principles (known as the 3Rs) of:

- Replacement – is it necessary to use live animals for the study or could non-animal alternatives be used?
- Reduction – what is the smallest number of animals that could be used to obtain scientifically valid results?
- Refinement – could the husbandry or experimental procedures be modified and made less harmful to the animals and still obtain the same scientific outcomes?

(Source: Russell and Burch (1959) ‘Principles of humane animal experimentation’)

In addition to the assessment of the welfare of animals undergoing experimental procedures, the welfare of laboratory animals should be assessed in their home cages, and the breeding stock. In addition, many animals are often kept in Universities and Colleges for the purpose of teaching science and veterinary students. It is important also, that good standards of animal welfare are adhered to for these animals, and the OiE produces specific standards to cover these animals (see section 15.7.1 below for more detail about the OiE standards).

In India, section 15 of PCA Act (1960) provides for the creation of a Committee for Control and Supervision of Experiments on Animals (CPCSEA) which has

the power to prohibit experiments. The Breeding of and Experiments on Animals (Control and Supervision) Rules 1998 contain more detailed regulation on animal experiments. Institutions must register to carry out animal experiments and obtain permission from the CPCSEA / or the Institutional Animals Ethics Committee (IAEC).

(For more details on Welfare of Laboratory Animals in India, please refer the units on CPCSEA and IAEC under MAW -003)

15.5.4 Other Species Including Pets

Most other species, such as pet animals or working animals, do not have formal methods for assessing welfare that are used very widely. As described above, often the welfare of animals in these circumstances might align with human welfare, although this is not always the case. The governments of many countries, such as those in India, have rules or regulations to prevent cruelty to animals used for draught or pack purposes (since 1965), rules and regulations for performing animals (since 2002), and rules for pet shops (2018). These can prevent, or provide legislative pathways for action, where there is actual animal cruelty, but do not provide frameworks for regular inspections and collection of animal welfare information. Several charities have developed standardized welfare assessment schemes that are used in some situations. For example, the equine charity, The Brooke (www.thebrooke.org) has developed an equine-based welfare assessment tool to give an overview of the general welfare condition of working equine animals, made up of 40 animal-based measures of welfare. The measures include such measures as:

- General health (such as eye and nasal health, body condition score, respiratory noise etc)
- Behaviour (such as response to the approach of a person, general attitude etc)
- Body lesions on defined areas (covering all aspects of the body)
- Deliberately-induced conditions (e.g. management practices such as nose or tail cutting)
- Pain-related issues (such as gait)
- Assessment of hooves and limbs (such as hoof shape and quality, hobbling lesions etc)

As this is a standardized assessment, we would expect that the data are reliable and robust, so that it can be used in many of the ways we have already described for other assessments.

In addition, both the OiE and the International Companion Animal Management (ICAM) Coalition provide guidance on welfare monitoring of dogs, particularly for stray dog population management. This provides information on assessing the welfare of free-roaming dogs, such as assessing body condition score.

(For more details, please refer MAW-002 and MAW-004 with units on welfare issues and standards pertaining to Working Animals in India)

15.6 TRAINING AND CERTIFICATION OF ANIMAL WELFARE AUDITORS

As you will have understood from this Unit and Unit 14, to have value, it is important that welfare is assessed consistently over time, and by different people using the same scheme. This generally requires training of assessors or auditors, so that they can achieve similar standards wherever they are working. For many global companies or charities, this means that local staff, working within a country, should be able to assess welfare in the same way, regardless of where they are working, so that results collected by different people are reliable. Training of welfare assessors usually requires some background understanding of the species in question, an appreciation of why particular measures are important, and then a more advanced training in the methods and measurements required for the species. This usually involves practical training alongside a trained and certified auditor, comparing scores, until the trainee is able to make similar assessments as the auditor. For certification purposes, an assessor would then need to pass a standard assessment in order to be seen as a qualified and certified assessor. In order to avoid ‘drift’ in assessors, some certifications also require auditors to have periodic re-training or re-assessments to ensure that they are still consistent in their welfare assessment approaches. Most certification bodies would require assessors to be trained and examined on their own standards and assessment protocols. However, there are also third-party certification companies, which train auditors independently and may provide inspections and reports for the certifying body.

15.7 POTENTIAL FOR INTERNATIONAL APPLICATION

So far, we have talked about certifications that are owned by companies or charities, or EU animal welfare standards. However, there are other applications of animal welfare standards that can be seen as more global, and applying to everyone. Perhaps the best known of these are the OiE standards, which you will already have heard about.

15.7.1 OiE Animal Welfare Standards

The first OiE standards on animal welfare were published in 2004 (for terrestrial or land-based animals) and in 2008 for aquatic animals. The first of these standards covered animal transport, slaughter and killing for disease control, followed by standards on the use of animals in research and education, stray dog population control and the welfare of working equids. More recently, the OiE has developed welfare standards for production systems of beef and dairy cattle, broiler (meat) chickens and pigs, with welfare standards for laying hens in progress. The OiE recommendations for production systems provide some animal-based measures that can be used as indicators of animal welfare in all systems, although the appropriate thresholds are suggested to be adapted to the different management situations. For example, for dairy cattle, the OiE recommends assessing welfare by measuring the following outcome-based criteria:

- Behaviour – such as feed intake, locomotory behaviour, lying time, coughing, etc.

Check Your Progress 3

Note: a) Use the spaces given below for your answers.

b) Check your answer with those given at the end of the unit.

1) Name the two types of welfare assessments available for farm animals.

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2) What do you understand by retailer or certification specifications of animal welfare?

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3) Write examples of resource-based farm animal welfare measures for the following:

a) Living conditions of the animals

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b) Feeding conditions of the animals

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c) Management conditions of the animals

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4) Why it is challenging to meet animal welfare needs in zoo?

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5) What do you understand by 3Rs principles?

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15.8 LET US SUM UP

- In this Unit we have discussed how animal welfare assessments and auditing can be carried out and the reasons why this may be done.
- We have discussed the practical issues that can arise when wanting to carry out an audit of animal welfare, and some of the decisions that may need to be made when planning an auditing process.
- We have looked at how the information gathered during an auditing process can be collated, presented and used to bring about improvements in animal welfare.
- We have presented some of the different standards and animal welfare assessment methods and protocols that are available and examined the key features of these schemes.
- We have considered the requirements for training of assessors and the importance of standardization in welfare assessment.
- We have looked at the internationalization of welfare assessment and the global standards that can apply to help to improve animal welfare worldwide.

15.9 KEYWORDS

3Rs: A set of three key principles in the use of animals in experiments. These are (in decreasing order of importance) replacement for the use of animals, reduction in the numbers of animals used and refinement to minimize the harms to the animal.

AWIN: Acronym for the Animal Welfare Indicators project, which was the second large animal welfare project funded by the European Union and developed welfare assessment protocols for a range of farmed species.

Codes of Practice: The guidance or rules of agreed practices that should be adhered to by an animal keeper. These are not legal documents, but the law may require the animal keeper to meet these specifications.

Compliance: An assessment that the law (in this case relating to animal welfare) is being met and thus the farm or facility is ‘compliant’ and doing as it should.

Feedback: Providing information about the scores achieved to the person being audited for animal welfare to allow changes to be made

Multi-dimensional Animal Welfare Assessment: Animal welfare should assess a range of different dimensions of animal welfare to be seen as comprehensive, and considering animal physical and mental requirements.

OiE: The world organisation for animal health, which provides a global strategy and standards for animal welfare.

Red-Amber-Green Scores: Application of a ‘traffic light’ scheme allows quick and easily understood feedback to be given where red means that animal welfare is poor, or in the danger area, amber is a warning and green means animal welfare is good, often used in comparison with other facilities.

RSPCA-Assured: The UK’s Royal Society for Prevention of Cruelty to Animals has a food certification scheme, previously known as Freedom Foods, which focuses on reducing confinement of farmed animals, and encouraging the use of space, comfort and enrichment.

Sampling: Where it is not possible to measure the welfare of all animals in a population, then a sampling method is required to select a suitable number of animals in an unbiased way on which to base the overall assessment of the population.

WAZA: The World Association for Zoos and Aquariums which provides guidance and standards of practice for zoos that are members of the association.

Weighting Scores: It is usually thought that not all aspects of animal welfare, as measured by a set of indicators, will be equally important for the animal. To avoid the bias that might come from simply adding all scores together, a ‘weighting’ (or multiplication) factor would be applied to the more important indicators to give them greater importance or weight in the final score.

Welfare Outcomes: Animal-based indicators of welfare are sometimes also referred to as ‘outcomes’ since they report on the actual impact on the animal, and are direct measures of welfare status.

Welfare Quality®: A large research project funded by the European Union, which developed welfare principles and criteria for meeting these, and produced some of the first comprehensive welfare assessment protocols based on animal-based indicators for welfare.

15.10 BIBLIOGRAPHY AND FURTHER READING

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Useful websites:

<https://www.oie.int/en/animal-welfare/an-international-network-of-expertise/>
<http://animaltransportguides.eu/materials/>
<https://www.nc3rs.org.uk/welfare-assessment>
<http://www.ahwla.org.uk/index.html>
<https://www.icam-coalition.org/tools/>

15.11 SELF ASSESSMENT EXERCISES

- 1) What are the differences between requirements of welfare legislation and Codes of Practice?
- 2) Discuss four reasons why we might want to assess animal welfare.
- 3) What factors might affect the implementation of a welfare assessment procedure?
- 4) What animal-based outcomes can be used to assess the welfare of laboratory animals?
- 5) What issues might conflict with the desires of zoos to provide good welfare for the species in their care?

15.12 ANSWERS / HINTS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) The specific reasons for animal welfare assessment / audit are: for ensuring compliance with minimal standards / legislation; for assessing the level achieved against a welfare bench-mark in an enhanced welfare scheme; to check on the welfare impact of a change in management, and to achieve continuous improvements in welfare.
- 2) Enforcement of legal requirements to avoid animal cruelty such as beating / over-loading often doesn't need specific welfare assessment schemes. However, compliance with more prescriptive legislation, or meeting requirements of Codes of Practice, may need more robust and complex welfare assessment schemes.
- 3) A welfare benchmark recognizes an animal keeping establishment has met some form of accreditation. For these schemes some form of inspection or audit is often required to ensure that the establishment is providing the level of care and welfare that the scheme requires. *Example:* The RSPCA assured mark in the UK.
- 4) The requirements for laying hens in RSPCA assured standards include: hens are never kept in cages; hens are provided with objects to peck at, such as knotted ropes and straw bales; litter and dust bathing boxes are provided which allow hens to dust bathe together, and; raised perches are provided to allow hens to rest undisturbed.
- 5) Examples for assessing the welfare impact of a change in management could be: when new animals are introduced in a zoo; changing animals from a housed to an outdoor environment; providing a treatment for an on-going health issue, and; implementing a change in building design.

- 6) As humans we often do not remember nearly as well as we like to think, and it is very easy to imagine that our animals have stayed the same or improved over time, but without the records we cannot know this for sure. In some schemes, such as compliance with minimum standards or benchmarks, the ability of the animal keeper to keep good records of animal welfare can be used as a way to reduce the frequency of external inspections and audits, if it can be demonstrated that welfare is being regularly and accurately recorded.

Check Your Progress 2

- 1) We need to identify welfare indicators in a fair and unbiased manner that are valid, reliable, feasible, and appropriate for the species, system and purpose.
- 2) The factors to be considered in welfare assessment include: sampling protocol; measures made on individual animals or on the whole group; individual animal assessment's impact on other indicators; factors like time of day and season; announced assessment or a surprise or unannounced visit, and who will collect the data - auditor / animal keeper who shares their records / a joint data collection.
- 3) The advantage of the announced visit is that, if inspection of records is required, then these can be prepared in advance, and that someone is present to meet with the inspector. Of course, this might also mean that the animal keeper could change conditions in the facility to give a better impression for the inspector, such as providing more or better quality bedding. The advantage of unannounced visits is that the inspector will see the facility in its 'normal' state, and can assess what the normal living conditions for the animals are.
- 4) The four ways through which welfare improvements can be achieved are: legislation and penalties or sanctions; advice and recommendations; animal-keeper training programmes, and welfare-friendly selection criteria for future breeding programmes.

Check Your Progress 3

- 1) The two types of welfare assessments available for farm animals are (1) Retailer or certification specifications and (2) Overall welfare assessment schemes.
- 2) The retailer or certification specifications of animal welfare are those that allow the use of a specialized animal welfare mark (such as RSPCA assured) or allow a supplier to provide animal products to a specific market.
- 3)
 - a) Living conditions of the animals : Amount of space each animal should have; The types of bedding available; Amount of light and dark that animal should be exposed to
 - b) Feeding conditions of the animals: Frequency of feeding or specific access to types of feed (for example provision of roughage for ruminant animals); Any permitted or forbidden practices (such as with-holding food for periods of time, or periods of confinement)

- c) Management conditions of the animals: When and what sort of procedures can be done to the animal (e.g. weaning, tail-docking etc) and what are the permitted methods; The size of the social group; Availability of species specific resources (such as nest sites, enrichment objects etc); The maximum journey time to slaughter.
- 4) Animal welfare should be an important goal of zoo. However, zoo usually needs to make money to survive through attracting the public to pay to enter the zoo. Thus, sometimes these objectives (of entertainment) may become more important than the welfare of the animals. For example, zoos may wish animals to be visible during the daylight hours when visitors are present, even if the animals is nocturnal or finds the presence of many noisy visitors very stressful.
- 5) Replacement – is it necessary to use a live animals for the study or could non-animal alternatives be used? Reduction – what is the smallest number of animals that could be used to obtain scientifically valid results?; Refinement – could the husbandry or experimental procedures be modified and made less harmful to the animals and still obtain the same scientific outcomes?



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