Comparison report of International Beef and Lamb Standards

Part 3

England, United States of America and Canada

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Executive summary

This report, produced by the team at Birnie Consultancy and scrutinised by a team of independent experts, outlines a forensic comparison of sheep and beef standards in England (Red Tractor, RT) to a range of other assurance schemes used in North America. These include Animal Welfare Approved (AWA), Canada Verified Sheep (CVS), Global Animal Partnership (Five Step) and Verified Beef Production (VBP). Unlike RT, whilst AWA and Five Step cover beef and lamb, they do so in separate standards. VBP and CVS cover single species only.

The report also includes a high-level outline of the legislative framework in each region in which the assurance schemes operate.

The report is part three of a series. The first (New Zealand, Australia) was released in April 2024, the second (Europe) in July 2024, and the final report (South America) is due to be released in the autumn of 2024. All analyses of global assurance schemes use the RT scheme as the baseline for comparison, and, where a consumer perspective was required, this is taken from the viewpoint of the English consumer. We have tried to account for the range of production conditions and practices in different countries through the application of weightings which reflect the importance of a specific practice or assurance category in each country.

It is important to note that this report is not commenting on whether a scheme is classified as adequate or inadequate. Instead, it is a detailed comparison of the content of each scheme across a range of assurance categories, allowing the reader to understand performance in the areas which are important to them. The intention of this report is not to demonstrate that any one scheme is superior or inferior to other schemes. Rather, it is intended to evidence the current position of standards, enabling informed discussion regarding the future of regulatory and voluntary schemes/initiatives.

Analysis

To enable the analysis, and as a direct result of each assurance scheme containing its own modules and categories which did not facilitate straight comparison, a series of fourteen categories were devised, and each of the schemes were scrutinised to understand and report their performance in each of these categories:

1. Traceability, Documentation and Assurance
2. Personnel
3. Food Safety
4. Housing and Shelter
5. Feed and Water
6. Husbandry Procedures
7. Youngstock Management
8. Animal Health and Welfare
9. Animal Medicines
10. Biosecurity and Disease Control
11. Livestock Transport
12. Vermin Control
13. Fallen Stock
14. Environmental Protection

Scores were awarded to each scheme based on how well it addressed the questions in each category (Appendix 1), and the question scores were then weighted within each category. The total section score was then weighted between the categories, and between the different countries in the study.

Country weightings

There are many common agricultural practices between each of the countries in the study, but there are slightly different contexts in which they are applied. Weightings were applied to reflect the importance of the

practice in the different countries relative to England, where the RT scheme was always weighted at 100. Within this specific report (Lot 3), weightings were different in the transport category, where, due to the potentially increased frequency of longer journey distances, control of transport in the USA and Canada was deemed to be more important than in England because of the potentially greater distances over which animals could be transported.

In addition, Housing and Shelter is weighted more heavily in the USA and Canada than in England, due to the more extreme climates in these countries, which increases the need for shelter. Fallen Stock is weighted more heavily in England than in the other two countries, primarily because of the proximity of farmland to people and to watercourses used to supply drinking water. Because the land area in North America is much greater than that in England, the majority of farms tend to be further away from densely populated urban areas.

Category weightings

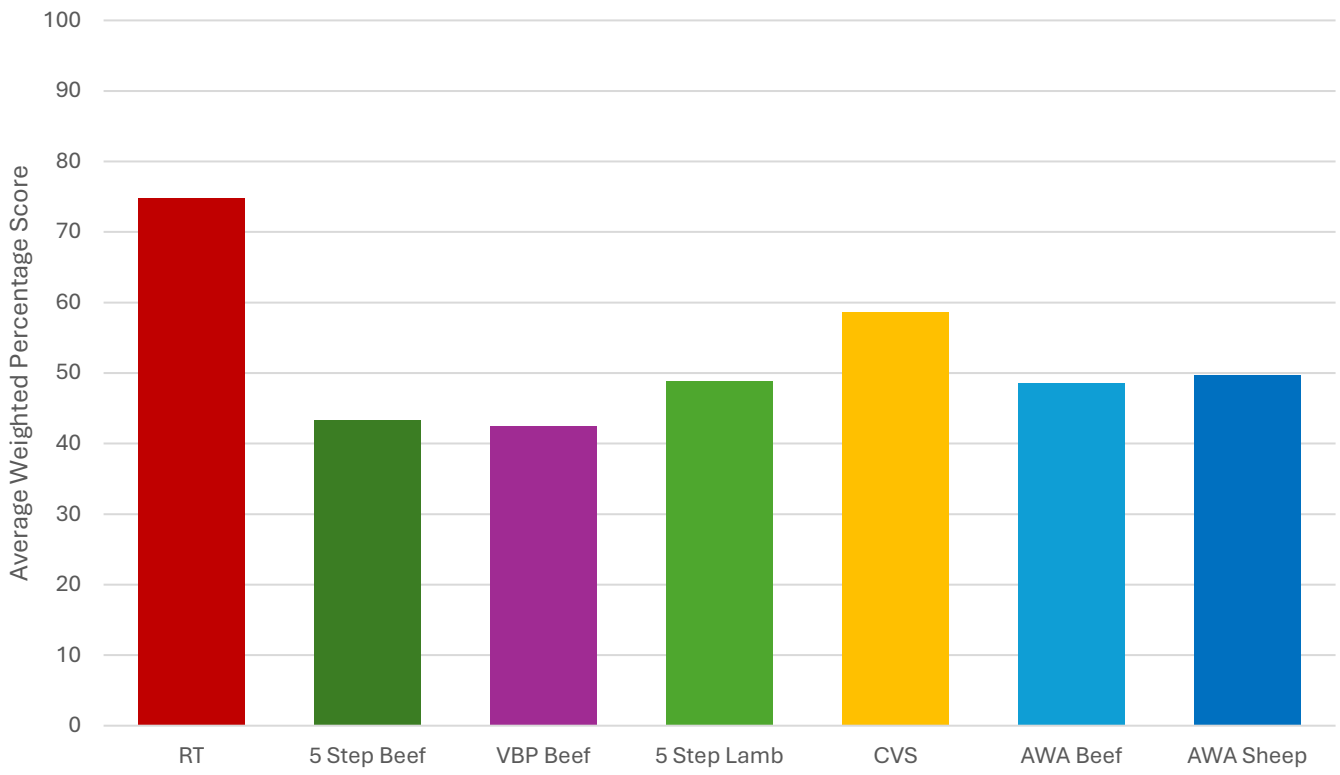
Each of the fourteen analysis categories were also awarded a weighting which reflected their relative importance to the other categories within the scheme. These weightings are shown at the end of the report.

Question weightings

Within each category some questions were recognised as more important than others, and weightings were applied to reflect the relative importance of each. The weightings are shown at the end of the report.

Summary of findings

Figure 1: Weighted percentage score for each scheme



The overall findings from this study show that, when directly compared, RT achieves higher scores than the majority of the other schemes across most areas. However, because the focus of schemes was different, this is not unexpected, and there are specific areas where individual schemes score more highly than or take a different approach to RT, meaning that there are areas where learnings can be taken and applied from all schemes.

Within this report, although a scheme's overall weighted score may be lower than another one, this does not indicate that the scheme is sub-standard. Scheme foci differ and, as a result, assurance requirements within the schemes will also differ.

Although each of the schemes is designed with its country's unique farming systems and food chains in mind (which were taken into account during the weighting for this study), RT and CVS were consistently found to be more detailed and prescriptive than the other schemes.

All of the schemes provide some degree of customer reassurance, but this varies according to the scheme and the specific category of study. Audit frequency and type of audit were used as one indicator of the effectiveness of each scheme.

Summary of legislation

The legislative framework in each country was researched as part of this project. This was not a forensic analysis, but was designed to uncover the broad base legislation against which farms operate and which will inevitably form some of the requirements within assurance schemes. Each country in this report operates within a legislative framework.

Legislation is useful, but by itself is rarely inspected. Farm assurance schemes provide a degree of assurance around adherence to legislation because this usually forms part of the inspection process.

Conclusions

RT achieved a higher total score than any of the other schemes primarily because it covers a wider range of factors, often in greater depth than the other schemes in the study. All of the schemes provide some degree of customer reassurance, but this varies according to the scheme and the specific category of study.

Introduction

This report, produced by the team at Birnie Consultancy and scrutinised by a team of independent experts, outlines a forensic comparison of sheep and beef standards in England (Red Tractor, RT) to a range of other assurance schemes used in North America; Animal Welfare Approved (AWA), Canada Verified Sheep (CVS), Global Animal Partnership (Five Step Beef & Lamb) and Verified Beef Production (VBP). It should be noted that Global Animal Partnership is often referred to as GAP, and should be distinguished from Global GAP standards which have not been considered in this report. The report also contains a high-level outline of the legislative framework in each country in which the assurance schemes operate.

The analysis of the assurance schemes uses the RT scheme as the baseline for comparison, and, where a consumer perspective was required, this was taken from the viewpoint of the English consumer. Scores were awarded out of 10 for each question, and the score awarded was in relation to what would be the 'ideal' answer to each question from an English consumer perspective.

It is important to note that this report is not commenting on whether a scheme is classified as adequate or inadequate. Instead, it is a detailed comparison of the content of each scheme across a range of assurance categories, allowing the reader to understand performance in the areas which are important to them. The intention of this report is to evidence the current position of standards, enabling informed discussion regarding the future of regulatory and voluntary schemes.

The report has been produced in response to requests to AHDB from industry partners to commission a study into standards of domestic production in comparison to key international competitors, identifying strengths and weaknesses in different global standards. This is the third of a series of studies which will be completed throughout 2024:

- Part One – Released April 2024 – Australia and New Zealand (beef and lamb)
- Part Two – Released July 2024 - Germany, Poland, Republic of Ireland, France[1], and Netherlands (beef and lamb)
- Part Three – US and Canada (beef and lamb)
- Part Four – South America (beef only)

Agricultural context within each study region

Assurance schemes are voluntary standards which establish production standards covering (but not being restricted to) food safety, animal welfare and environmental protection. Each of the countries in this comparison operate within different frameworks and have different foci. As independent standards, they have the ability to go above and beyond what legislation requires and can help to promote farming to the general public.

England

Farm assurance in England commenced with a basic series of standards which were designed to enable the scheme to be accessible to consumers while still raising standards. Over the years different schemes have developed, adding new requirements as consumer expectations change and issues of concern arise. There is still considerable push-back on occasion as new standards are introduced to meet emerging demands, sometimes from farmers and sometimes from processors due to the difficulties associated with meeting some

[1] Author's Note: This report was originally intended to analyse a Spanish farm assurance scheme. As no adequate scheme could be found for analysis, a French scheme was selected instead.

expectations. Several different farm assurance schemes operate in England, but almost all of these operate alongside Red Tractor. English farm assurance schemes include:

Red Tractor
Very well established in England, Red Tractor was created to revive consumer confidence in British food. It was set up in 2000 and is the most well-known and accepted scheme in England, sought after and respected by processors, retailers and consumers.

LEAF Marque
A global assurance system that recognises sustainable food production, LEAF Marque is underpinned by integrated farm management, which is a site-specific, whole farm approach to farming.

RSPCA Assured
Developed by the Royal Society for the Prevention of Cruelty to Animals (RSPCA), this standard covers every aspect of the animals' lives, including feed and water provision, the environment they live in, how they are managed, health care, transport and humane slaughter/killing.

RT was chosen as it is the most common assurance scheme applied on English farms.

USA

Farm assurance in the USA is more disparate than in England, with multiple schemes covering supply chains. The following schemes are typical:

Five Step Beef and Five Step Lamb
The Five Step Assurance Schemes are operated by Global Animal Partnership, being focused on the welfare of animals. There are three main foci within the scheme: health and productivity, with the aim being to raise healthy, productive animals; natural living, with the aim being to ensure that animals can display natural behaviours, and; emotional wellbeing, with the aim being to raise animals in environments that provide them with the ability to be inquisitive and playful. The Five Step schemes have been taken up by retailers in the USA and take an approach which may be relevant to the development of assurance in England.

Beef Quality Assurance
Beef Quality Assurance (BQA) is a certification programme from the United States of America that is aimed at providing consumer reassurance with regard to how cattle are raised, with animal welfare and food safety as priorities. The programme aims to provide technical information to U.S. beef producers, encouraging good husbandry techniques to be coupled with accepted scientific knowledge to optimise management systems. The system is structured differently to many other assurance schemes and, although it contains a wealth of useful information, it acts more as a guide for training than as an assurance scheme.

Humane Farm Animal Care (HFAC)
Humane Farm Animal Care is a USA based, nonprofit certification organization which is focused on improving the lives of farm animals in food production from birth through slaughter. The goal of the programme is to improve the lives of farm animals by expanding consumer awareness, driving the demand for kinder and more responsible farm animal practices. Two sets of welfare focused schemes were already being analysed within this report, and therefore HFAC was not included in this particular study.

Animal Welfare Approved (AWA)
Animal Welfare Approved (AWA) is certified by A Greener World (AGW) and contains standards around farm animal welfare and environmental sustainability. The standards were developed in collaboration with scientists, veterinarians, researchers and farmers, to facilitate implementation of systems of practical, high-welfare farm management with the environment in mind. The standards cover all major farmed livestock sectors. The focus is on enabling natural behaviour, and improving the impact of the farming system on the

environment. The standards require animals to be raised at pasture and prohibit dual production standards, so all animals within the AWA category the farm is certified for (i.e. beef or sheep) must be produced to AWA standards. Much of the AWA approach could have value in England, and consequently the standards were included in this study.

Canada

Canadian Verified Sheep Programme (CVS)

The Canadian Verified Sheep Programme (CVS) is a voluntary on-farm food safety programme that was developed through a partnership between producers, industry and government personnel from across Canada. The system is built up from a range of modules which have been added over time. The scheme was developed by producers with input from veterinarians, industry stakeholders and government.

Verified Beef Production (VBP)

The Verified Beef Production Plus (VBP) programme is a commercially focused scheme that is aimed at allowing beef producers to prove to consumers, retailers, and industry stakeholders that their operations adhere to appropriate standards for food safety, animal care, social responsibility, and environmental stewardship. The scheme is operated under the umbrella of the Beef Cattle Research Council in Canada. The VBP programme covers the full range of beef production, from birth to finishing and was consequently included for comparison in this report.

Canadian Feedlot Audit Programme

The Canadian Feedlot Audit Programme was developed by feedlot producers, veterinarians, animal scientists, and beef welfare experts. It is aimed at providing the Canadian beef industry with a credible and widely accepted assurance standard for feedlot animal care and welfare, beef quality and food safety assessment programme that can be used by all stakeholders to improve animal care and provide reassurances to consumers and the public that feedlot cattle are raised humanely and safely. This is a feedlot only programme and was therefore not included in this report.

Outline of farm assurance schemes chosen for study

The schemes studied within this report were chosen because they either have the widest coverage of any farm assurance scheme within the USA or Canada, or contain standards and approaches which are of relevance to the further development of English standards.

Red Tractor (RT), England

All RT farms are inspected every 18 months, allowing farms to be inspected during different seasons and stages of production, e.g. if animals are housed and are out at grass at different periods of the year. Audits are carried out by independent auditors under the control of the two licenced certification bodies, NSF and Intertek SAI Global.

RT deliver approximately 60,000[2] supply chain inspections annually (farms, transporters and processors), delivered by over 350 independent inspectors. Approximately 3,000[3] farms of all types (livestock, arable and fresh produce) failed the inspection and were suspended from the scheme in 2020, and had to apply corrective measures. These farms had their approval removed until the corrective measures were evidenced.

Most inspections are announced, and the farmer can prepare for the audit. However, depending on the nature and number of non-conformances found during routine inspections, members may be subject to unannounced inspections – numbers for which are not available.

RT facilitate a range of commercial bolt-ons and retain the ability to create additional general access bolt-ons where this is deemed to meet the needs of the industry.

The standard audited for this report was version 5.0.

Animal Welfare Approved (AWA), USA

Animal Welfare Approved (AWA) is certified by A Greener World (AGW) and contains standards around farm animal welfare and environmental sustainability. The standards were developed in collaboration with scientists, veterinarians, researchers and farmers, to provide systems of practical, high-welfare farm management with the environment in mind. The standards cover all major farmed livestock sectors. The focus is on enabling natural behaviour, and improving the impact of the farming system on the environment. The standards require animals to be raised at pasture, and also prohibit dual production standards. The AWA Beef standard was analysed as well as the AWA Lamb scheme.

The beef standard considered in this report was version ST9v1 - AWA Beef Cattle Standards 2023 041123, and the lamb scheme was ST13v1 - AWA Sheep Standards 2023 041123.

Canada Verified Sheep (CVS)

The Canadian Verified Sheep Programme (CVSP) is a voluntary on-farm food safety programme that was developed through a partnership between producers, industry and government personnel from across Canada. The system is built up from a range of modules which have been added over time. The scheme was developed by producers with input from veterinarians, industry stakeholders and government.

Audits are conducted by Canadian Sheep Federation (CSF) certified auditors who are trained in Hazard Analysis and Critical Control Point (HACCP) programmes, auditing and the Canadian Sheep and Lamb Food Safe Farm Practices (FSFP) programme. Farms within the scheme receive a full audit once every four years,

[2] Red Tractor, https://redtractor.org.uk/our-current-campaign/red-tractor-works-with-independent-inspectors-who-ensure-our-rigorous-standards-are-met/

[3] https://plantbasednews.org/animals/what-is-red-tractor-assured-meat/

with self-declarations in years two and four, and a records review in year three. All auditing is under the direct oversight of the CSF, with audit reports reviewed for accuracy, consistency and compliance with programme intentions.

The standard audited for this report was the 2016[4] version.

Global Animal Partnership (Five Step), USA

Global Animal Partnership is a USA based organisation that is focused on the delivery of meaningful continuous improvement in the welfare of farmed animals. They state that they develop, implement and verify multi-level standards which are backed by science and which enable animals to display their natural behaviour. The organisation is highly focused on standards development and operate a scientific advisory committee that contains a range of highly specialist individuals from across the world who advise on the most appropriate actions and practices.

The standards audited for beef in this report were level 2 of version 1.1 and for lamb level 4 of version 1.4. These levels were chosen as they are the most equivalent to the standards used in England.

Verified Beef Production, Canada

The Verified Beef Production Plus (VBP) programme is a commercially focused scheme that is aimed at allowing beef producers to prove to consumers, retailers, and industry stakeholders that their operations adhere to appropriate standards for food safety, animal care, social responsibility, and environmental stewardship. The scheme is operated under the umbrella of the Beef Cattle Research Council in Canada.

The standard audited for this report was version 1.6.

Coverage of legislation within the study

As part of the study programme, legislation within each region was investigated. This was not a forensic study to the same level of detail as delivered for the assurance schemes but was intended to give a broad understanding of the legislative framework in which farming and the assurance schemes operate. An important factor to note for this study is that just because a component is contained within legislation, it will not be considered to be part of the assurance scheme (and scored accordingly within this study) unless the scheme specifically refers to it and audits against it. This is because farm assurance audits take place much more frequently than government inspections against regulatory compliance and thus the presence of legislation alone does not guarantee compliance.

[4] CVS was updated in 2017, which incorporates an animal assessment programme as well as an biosecurity assessment programme. Assessors only had access to the 2016 for the purposes of this report.

Authors

After a rigorous tender process, Birnie Consultancy were appointed by AHDB to undertake this series of Reports. Birnie Consultancy is a solutions-driven consultancy working with primary and secondary food processors, farmers, supermarkets, levy bodies, research institutions and governments across the UK and Europe. They have vast experience in the comparison of farm assurance standards, having previously completed several analyses of global farm assurance schemes.

Dr Jonathan Birnie

With over 25 years of comprehensive whole-chain experience in the Food Industry, Jonathan is well connected and brings vast experience to the project.

He is a graduate of Edinburgh University with a PhD from the Agricultural Research Institute of Northern Ireland/Queens University Belfast. He has worked as a Policy Advisor for the National Farmers Union in England before moving on to become Sainsburys' Agricultural Manager. Headhunted by Dunbia (one of Europe's leading red meat processors), he then spent 13 years running Agricultural Supply Chain Research and Development, finishing as Head of Agriculture and Research (reporting to company CEO) with a team spread across the UK. Jonathan is also a Nuffield Scholar (2014 year) where he studied methods of effecting change in agriculture and food production.

Dr Iain Maguire

Iain has over ten years of experience in analytical, laboratory and scientific disciplines. Before joining Birnie Consultancy, Iain graduated with a PhD in Animal Behaviour and Welfare from Queen's University Belfast. He has published a range of scientific papers and has proven experience in the collection, handling and analysis of a wide range of data. He is an experienced research project manager, having delivered multiple programmes across Queens University and Randox. As a beef suckler farmer, Iain also brings first-hand experience of farm assurance standards, and how they are applied in real-life situations.

Ashley Hassin

Ashley has over 15 years of experience working in communication and publishing. Having joined Birnie Consultancy in 2020 he has gained a wealth of knowledge on a variety of subjects, including farm assurance standards. His research, project management and communications skills have been essential to the successful delivery of project with multiple high-profile clients. These have ranged from business start-up management, farm research projects, consumer research, industry analysis, CSR report production, editing, copywriting, and auditing.

Independent experts

To ensure that this series of reports is as credible as possible, four independent experts were recruited from an open process to scrutinise findings. At different stages they were invited to provide constructive feedback to enhance the quality of each report and ensure that credible, authentic, and independent conclusions were drawn. The experts reviewed and approved the following aspects of each study;

1. *The key assessment criteria utilised by the research agency.*
2. *The final scoring associated with the assessment.*
3. *The relevant weightings of the scores, to ensure as accurate and robust a comparison as possible.*
4. *The final report's findings, ensuring they are accurate.*
5. *The final report's key conclusions, ensuring they are credible.*

Mandy Lucas, farm animal welfare consultant

Subjects covered in this report: Biosecurity and disease control; fallen stock; traceability and documentation

Mandy is an experienced animal welfare specialist who is committed to socialising animal welfare throughout the supply chain, from primary producer to consumer.

She has been successful in facilitating conversations across global, diverse supply chains to understand animal production methods and welfare changes created by current farming methods, while providing practical solutions and pragmatic compromises to improve animal welfare whilst balancing the commercial business needs and sustainability goals.

Jude Capper, livestock sustainability consultant and Harper Adams University

Subjects covered in this report: Environmental protection; feed and water; livestock transport; vermin control

Jude is an experienced animal scientist, with a record of publishing results in high-impact journals, using her skills to educate and inform global food system stakeholders. She has two main roles, acting as both the ABP Chair and Professor of Sustainable Beef and Sheep systems at Harper Adams University (HAU) in Shropshire, UK; and as an independent Livestock Sustainability Consultant.

Jude's research focuses on modelling the sustainability of livestock production systems, specifically dairy, beef and sheep. She is currently working on projects relating to on-farm greenhouse gas emissions from UK beef and sheep production; the sustainability of smallholder farming, and the impacts of livestock health on system sustainability. Jude is a liveryman of the Worshipful Company of Butchers and Treasurer of the National Beef Association. She is also Chair of the Route Panel for Agriculture, Environment and Animal Care and Vice-Chair of the Green Apprenticeships Advisory Panel at the Institute for Apprenticeships and Technical Education.

Nigel Scollan, Queen's University, Belfast

Subject covered in this report: Food safety; housing and shelter; personnel; young stock

Director of the Institute for Global Food Security (IGFS) and Chair of Agriculture & Sustainability at Queen's University, Belfast, Nigel's research seeks to underpin the development of more sustainable and resilient food supply chains with focus on animal protein.

His research includes advancing the development of metrics to describe sustainability of farm systems and is using large and multi-data systems and machine learning approaches to support on-farm decision making to underpin the sustainability credentials of supply chains.

Jonathan Statham, Veterinary Surgeon, farm & livestock sustainability consultant

Subjects covered in this report: Animal health and welfare; animal medicines; husbandry procedures

A graduate of Cambridge University Veterinary School, Jonathan has over 25 years of experience in the industry. He is Chief Executive of RAFT Solutions Ltd, Chair of Bishopton Veterinary Group, and Professor of Sustainable Livestock Health & Welfare at Harper & Keele Veterinary School.

Jonathan holds, and has held many prestigious posts including President of the British Cattle Veterinary Association (BCVA) and the Yorkshire Veterinary Society as well as having sat on the GB 'Cattle Health & Welfare Group' (CHAWG), GB 'Sheep Health & Welfare Group' (SHAWG), the Veterinary Policy Group (VPG) of the British Veterinary Association (BVA) and is a past director of Cattle Health Certification Standards (CHeCS) and member of the 'Farmskills' Steering Group.

He is currently Chair of the Animal Health and Welfare Board England, a member of the GB Ruminant Health & Welfare Steering Group and Veterinary Products Committee of the Veterinary Medicines Directorate (VMD). He also chairs the InSHAW (Institute for Sustainable Livestock Health and Welfare) Leadership Group.

Methodology

We studied seven schemes within this report. These included Animal Welfare Approved (AWA), Canada Verified Sheep (CVS), Global Animal Partnership (Five Step) and Verified Beef Production (VBP). Unlike RT, whilst AWA and Five Step cover beef and lamb, they do so in separate standards. VBP and CVS cover single species only.

In this report - with the exception of RT tractor - the standards have been split out into separate beef and lamb documents (AWA beef, AWA lamb, Five Step Beef, Five Step Lamb). Where a scheme only covers one species, it has a lower potential raw score. The final percentage score awarded to each scheme is calculated from the maximum potential score for each scheme, meaning that the schemes which only cover one species have their percentages calculated using a lower maximum raw score, ensuring that the final percentages are fair and reflective of the actual performance of the scheme. We provide tables at the end of the report which show the comparison of all schemes for beef only, and sheep only.

The direct comparison of farm assurance schemes is not straightforward. Schemes are designed for different reasons and have diverse foci. Most schemes are structured differently, containing a range of modules and topics, and governing different practices. This is appropriate as production practices differ very strongly across the world. As a consequence, we have carefully designed the analysis process to enable a balanced comparison of the standards, based on the typical production processes in the regions where the schemes are used.

Analysis by category

A series of categories were devised for the farm assurance analysis. This was a direct result of each assurance scheme containing its own modules and categories which did not facilitate a straight comparison. Fourteen categories were created and the content of each scheme for each category was compared, and a score applied subjectively, based on how well it addressed the criteria. This necessitated the summarisation of the relevant content of each scheme and its entry into a database for comparison against the other schemes for each category. This was deemed to be the fairest way to enable comparison. The categories were:

- Traceability, Documentation and Assurance
- Personnel
- Food Safety
- Housing and Shelter
- Feed and Water
- Husbandry Procedures
- Youngstock Management
- Animal Health and Welfare
- Animal Medicines
- Biosecurity and Disease Control
- Livestock Transport
- Vermin Control
- Fallen Stock
- Environmental Protection

Assessment against a series of outcome questions

Because the schemes were so different, a line-by-line comparison was not possible. Instead, each scheme was assessed against a series of questions within each category. The questions for each category are shown in each of the category analysis sections below and are also shown in the appendices.

Equivalence

The analysis has employed the principle of equivalence throughout. It is not sensible to mark a scheme down if it does not address a practice which does not exist or is highly infrequent in the region in which it is targeted.

Application of weightings to the data to reflect the relevant impact of each component

To reflect the value of each scheme component, a series of weightings were applied to the data. Weightings are acknowledged to be at least partially subjective and are a judgement call from experts who have in mind the expectations of English consumers, as well as the scientific evidence for best practice. Three levels of weighting were applied:

1) **Within category weightings** were applied to each question within the category to reflect the fact that some of the assessment questions asked in each category are more important than others
2) **Between country weightings** were applied to the total score from each category to reflect the importance of each category within each country
3) **Between category weightings** were applied to the total score from each category to reflect the relative importance of the categories in relation to each other

A worked example is provided at the end of this section to show how the weightings were applied.

Application of weightings within each category

A first weighting was applied to each of the questions within each category. Each of the questions posed combine to give an overall assessment of the suitability of the scheme, but some of these deal with issues which are more important than those addressed by other questions. As a consequence, it is important to reflect the importance of each question using a weighting within the category, with ten representing the highest importance and one the lowest. This weighting was used with the raw score for each question to produce a total weighted score for each scheme for each category.

Application of country weightings

Within the analysis we have applied country weightings to each category within the analysis. The application of weightings is an extension of the 'equivalence' principle. In each of the different countries, there are common practices, but the frequency of these practices is very different. Consequently, for the scores applied to each analysis section we have applied them on a relative basis to England, where the RT scheme is weighted at 100 for everything, and the schemes in other countries are weighted above or below this depending on how relevant each factor is deemed to be with regard to farming practices and systems within each region. An example of this is that the potential impact of transport in the USA and Canada, where the potentially longer transport distances (when compared to England) means that transport is proportionally more important and therefore receives a higher weighting. The country weightings are shown in Table 1:

Table 1. Country weightings adapted

Heading	England Weighting	USA Weighting	Canada
Traceability, Documentation and Assurance	100	100	100
Personnel	100	100	100
Food Safety	100	100	100
Housing and shelter	100	120	120
Feed and Water	100	100	100
Husbandry Procedures	100	100	100
Youngstock Management	100	100	100
Animal Health and Welfare	100	100	100
Animal Medicines	100	100	100
Biosecurity and Disease Control	100	100	100
Livestock Transport	100	150	150
Vermin Control	100	80	100
Fallen Stock	100	90	80
Environmental Protection	100	100	100

Application of category weightings

Each of the fourteen analysis categories were also awarded a weighting which reflected their relative importance within the scheme. These weightings are shown below, and it can be seen, for example, that food safety is awarded a much higher rating than Vermin Control or Personnel. We acknowledge that there will be debate around these weightings and recognise that they are subjective, but in the opinion of the experts who created this study and those who peer reviewed it, they are reasonable reflections of the importance of each category from a farm assurance perspective.

Table 2 Category weightings for each farm assurance category

Heading	Relative Weighting
Traceability, Documentation and Assurance	200
Personnel	110
Food Safety	200
Housing and shelter	120
Feed and Water	150
Husbandry Procedures	150
Youngstock Management	105
Animal Health and Welfare	150
Animal Medicines	150
Biosecurity and Disease Control	150
Livestock Transport	95
Vermin Control	70
Fallen Stock	70
Environmental Protection	150

Worked example

The following example uses illustrative data for the Housing and Shelter category to demonstrate how the weightings were applied within the scoring.

Stage 1: Within category weightings

The first application of weightings is made within each individual category. Each question has been awarded a weighting to reflect its importance against the other questions in that category. The raw score for each question (Column A) is multiplied by the question weighting (Column B) to give the weighted actual score for each question (Column C). A maximum potential score for each question is also calculated at this point (Column D).

Table 3. Category weightings for each farm assurance category

		Column A	Column B	Column C	Column D
Housing and Shelter Questions		**Question Raw Score**	**Question Weighting**	**Weighted Actual Score**	**Weighted Maximum Potential Score**
A	Is housing well-designed and safe?	8.5	10	85	100
B	Does housing promote high welfare?	6.5	10	65	100
C	Is housing hygienic?	5	10	50	100
D	Is there adequate ventilation?	8	10	80	100
E	Is housing well-lit?	7	8	56	80
F	Is housing structurally sound?	8	10	80	100
G	Is there adequate space available for each animal?	7	10	70	100
H	Are loading and unloading facilities available and to a good standard?	8	7	56	70
I	Are there appropriate isolation and birthing facilities?	8	9	72	90
J	Is housing appropriate and safe for stock managers?	7	10	70	100
K	Do animals outside have access to appropriate shelter?	10	6	60	60
L	Are animals kept outside kept in appropriate conditions, including well drained lying areas and the absence of severe poaching?	10	10	100	100
M	Are bedding requirements appropriate?	5	10	50	100
N	Are requirements for records appropriate?	8	10	80	100
Total Within Category Weighted Score for Category				**974**	**1300**

Stage 2: Between country weightings

Country weightings have been applied to the maximum potential score (Column F multiplied by Column G) for each category. This weighting adjusted the maximum potential score up or down, or left is as it was, depending on whether the weighting was above 100, below 100 or equal to 100. This meant that the final percentage calculated score rose for those countries in which the category was agreed to be less important and fell where it was deemed to be more important. The final percentage score was calculated by dividing Column E by Column H.

Table 4. Country weightings for each farm assurance category

	Column E	Column F	Column G	Column H	Column I
Housing and Shelter	**Weighted Within Category Score**	**Country Weighting**	**Maximum potential category score**	**Corrected maximum potential score for each country (F x G)**	**Calculated percentage score (E/G)*100**
Country 1 scheme	974	100	1300	1300	74.9%
Country 2 scheme	433	50	1300	650	66.6%
Country 3 scheme	302	25	1300	325	92.9%

Stage 3: Between category weightings

The final stage of weightings was applied between categories, and is delivered by multiplying the previously calculated 'within category and between country' weighted score (Column J) by the between category weighting (Column L), giving a fully weighted score for each scheme for each category (Column M).

At the same time the maximum potential fully weighted score for each category was calculated by multiplying the previously calculated 'within category and between country weighted maximum potential score' (Column K) by the category weighting (Column L).

The calculations of the actual fully weighted score and the maximum potential fully weighted score allowed the calculation of the scheme's actual performance as a percentage of the potential maximum, which has been rounded to the nearest figure. (Column O).

Table 5. Calculations of the fully weighted score

	Column J	Column K	Column L	Column M	Column N	Column O
Category	**Weighted score within Category and between Country**	**Maximum Potential weighted score for each scheme within Category and between Country**	**Between Category Weighting**	**Category, Country and within Category Weighted Score**	**Maximum potential Category, Country and within Category Weighted Score**	**Category Score as a percentage of the total potential maximum**
Food Safety			200			
Housing & shelter	97,400	130,000	120	11,688,000	15,600,000	75%
Feed and water			150			

Scoring as a percentage of total maximum possible weighted score

The final reported scores from each scheme are presented as a percentage of the maximum possible weighted score. It was necessary to use percentages because in many sections the maximum total raw or weighted potential score for many of schemes differed from one another within each category (depending on whether they covered one species or two species within the one scheme), and thus a raw score was not reflective of the actual performance of the scheme.

Using percentages allowed the relative importance of the factors within each scheme to be accounted for and to be reflected fairly in the final overall scores which each scheme received.

Reflecting where specific practices or categories are not as important within a country

It should be noted that the within category scores shown in the spider diagram are weighted percentage scores. If the scheme does not answer a particular question either comprehensively or at all, the score will be low. If, however, that question is less relevant to that country, the weightings will account for this by reducing the maximum possible score from which the percentages are calculated.

Thus, in each of the performance categories represented below, the table which follows the spider diagram shows the final weighted percentage scores for each scheme. Where the subject of the question is less important within a specific country, the country weightings which are applied will correct for this. Therefore, the spider diagrams are simply guides for scheme developers to show where a scheme has or has not addressed a specific question. The final percentage scores in the table are those which should be used to gain an understanding of how effectively the assurance scheme minimises risk within that investigative category.

Findings from the analysis

Traceability, Documentation and Assurance

The Traceability, Documentation and Assurance category was included as it is the single most important component of any assurance scheme. An effective farm assurance scheme must inspect and record against a clearly defined set of standards and must, to a high degree of confidence, be able to assure that the livestock products which are eventually sold can be traced back to the farm from which it originated. To this end, the basic scheme standards must be robust, and the documentation created by the scheme detailed and specific enough to allow the user to be confident that the scheme delivers against its stated aims.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Traceability, Documentation and Assurance category;

A. Are cattle individually identified on the farm of origin?
B. Are sheep individually identified on the farm of origin and linked to a dam?
C. Is tagging/identification required close to time of birth for cattle?
D. Is tagging/identification required close to time of birth for sheep?
E. Is there a central database recording all farm movements?
F. Do cattle movements have to be individually reported to a central database within an acceptable timeframe? (inside 3 days)
G. Do sheep movements have to be individually reported to a central database within an acceptable timeframe? (inside 3 days)
H. Is a Food Chain Information declaration (or equivalent) required to travel with animals which are being transported to slaughter?
I. Is the traceability system robust (Cattle)?
J. Is the traceability system robust (Sheep)?
K. Audit frequency?
L. Auditor training and standardisation?
M. Are cattle assured from birth?
N. Are sheep assured from birth?
O. Are the certification bodies required to be accredited to ISO17065, with the specific standard within their scope?
P. Do assured animals need to be transported by assured transporters to retain their approval status?

Figure 2. Percentage weighted scores for each question area for the Traceability, Documentation and Assurance category

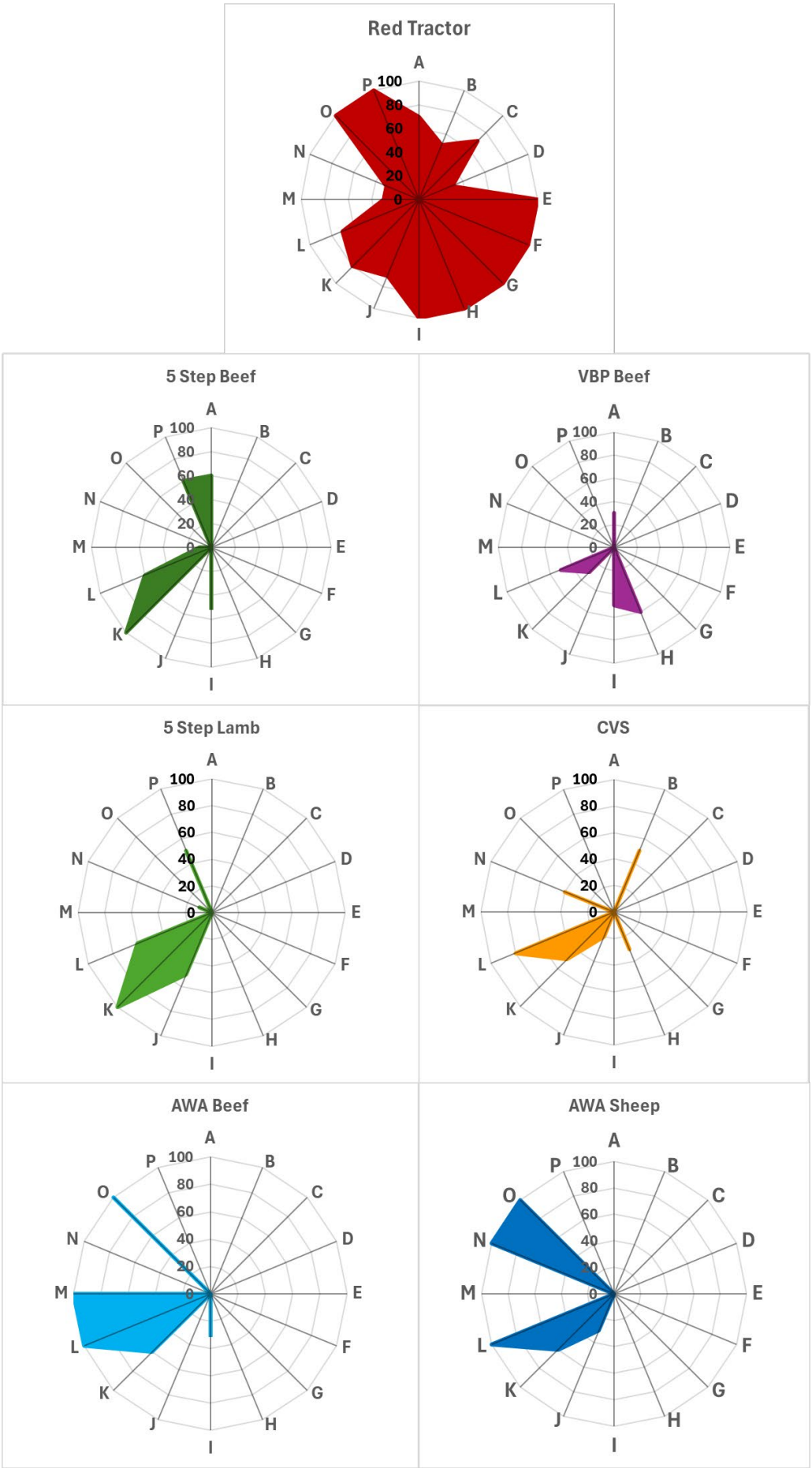


Table 6. Scores for the Traceability, Documentation and Assurance category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	120/160	77
Five Step Beef	34/110	30
VBP	22/110	22
Five Step Lamb	27/110	24
CVS	27/110	25
AWA Beef	39/110	36
AWA Sheep	39/110	37

Summary of findings

RT receives higher scores than all the other schemes within the Traceability, Documentation and Assurance Section. The other schemes have very similar scores in this section, but all score less than half that of RT. This is primarily a function of the more detailed cattle and sheep identification requirements in England (and inspection against this), the detailed record keeping requirements within RT, the regular audit frequency and the fact that the scheme is ISO17065 accredited. None of the other schemes combine all of these features and consequently score lower than Red Tractor.

Individual scheme findings

Red Tractor

RT requires individual identification of cattle (close to birth) and sheep (prior to leaving the holding), and also requires detailed record keeping. There is a central database for recording of movement. However, assurance periods are short, with full assurance being granted after 90 days (for cattle) and 60 days (for sheep). RT does require that assured transport is used. RT inspects farms approximately every 18 months, depending on the farming system that is in place. There is good training in place for auditors to ensure standardisation between different auditors. The scheme is ISO17065 accredited.

Five Step Beef

Five Step Beef requires individual identification, and the producer must be able to demonstrate traceability of all certified animals. There is a requirement to record all locations where each animal has been kept since birth. However, animals do not have to be identified close to birth, and this can lead to reduced accuracy of identification. The residency period for animals to become assured is unclear within the Five Step Beef scheme. Audits take place every 15 months and are delivered by independently trained and ratified auditors. The scheme is not accredited to ISO17065.

VBP

Individual identification is a requirement in Canada, but is not specifically inspected by the VBP scheme. Animals do not have to be identified close to birth, and this can lead to reduced accuracy of identification. The scheme requires that basic Food Chain Information travels with cattle which leave the farm. Audit frequency under VBP is very low, relying on self-certification in years three and five, with a review of records during years two and four. The residency period for animals to become assured is unclear within the VBP scheme. The scheme is not accredited to ISO17065.

Five Step Lamb

Five Step Sheep does not specify individual identification, although batch identification is required as animals leave the farm. There is no guidance around Food Chain Information that should travel with sheep which move off the unit. The residency period for animals to become assured is unclear within the Five Step Lamb scheme. Audits take place every 15 months and are delivered by independently trained and ratified auditors. The scheme is not accredited to ISO17065.

CVS
CVS as a scheme does not require individual identification, although this is required by Canadian law. There is no requirement for animals to be identified close to the time of birth. There is no requirement for Food Chain Information to travel with animals that leave the unit, although there are requirements in place to ensure that animals which are shipped are not within a medicine withdrawal period or contain a physical contaminant such as a broken injection needle. A farm receives a full audit once every four years, with self-declarations in years two and four, and a records review in year three. The scheme is not accredited to ISO17065.

AWA Beef
The AWA beef scheme does not have a requirement for individual identification, and also does not specify the Food Chain Information that should travel with animals when they leave the farm. AWA is a birth to slaughter scheme, requiring that cattle are fully covered by AWA assurance throughout their lives. Audit takes place annually, and the scheme is ISO17065 accredited.

AWA Lamb
The AWA lamb scheme does not have a requirement for individual identification, and also does not specify the Food Chain Information that should travel with animals when they leave the farm. AWA is a birth to slaughter scheme, requiring that sheep are fully covered by AWA assurance throughout their lives. Audit takes place annually, and the scheme is ISO17065 accredited.

Legislative requirements

England
RT requirements are based on a number of regulations within England governing traceability of livestock. These include Cattle identification Regulations 2015 (CIR), EC Hygiene Regulations and the SAGRIMO Order enforcing the Council Regulation (EC) 21/2004.

Under these regulations, powers are given to the competent authorities and specify requirements for keepers with respect to notification of holdings, ear tags, registration of cattle, cattle passports, notification of movements or death, and record keeping. The key requirement for traceability is the requirement to tag individual animals.

USA
Traceability regulations in the USA are designed to improve the ability of animal health officials to trace livestock when disease is found. Official identification numbers are used, and must adhere to the following:

- Animal Identification Number (AIN).
- National Uniform Ear tagging System (NUES).
- Location-based number system.
- Flock-based number system.
- Any other numbering system approved by the APHIS Administrator to officially identify animals.

Official identification devices and methods vary by species and include RFID ear tags, visual ear tags and RFID injectable transponders.

Canada
In Canada cattle and sheep must be identified with an approved tag before leaving their farm of origin. The livestock identification programme (TRACE) requires identification with an approved tag – with tagging required before animals leave a site. The tag must be species appropriate and applied with the number and logo facing forward. The animal must retain the tag until identified in another manner provided for under the regulations.

Personnel

The Personnel category has been designed to test the assurance which the schemes provide around the welfare of those who access and work on farms. This concept includes the safety of staff as they work on the farm, the induction and training that is required, the qualifications which are necessary for a person to work on the unit, the ways in which competency and training needs are assessed, and the continuous professional development that takes place on the farm.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the personnel category;

A. What qualifications are required for farm staff?
B. Is staff induction required?
C. Is staff training required?
D. What training records are required?
E. What topics are covered in training and do these meet the needs of the farm staff appropriately?
F. How often is training required?
G. Are appropriate Health and Safety policies required?
H. Is the performance of employees reviewed regularly and appropriate training given if required?
I. Is labour provision from external providers adequately covered?

Figure 3. Percentage weighted scores for each question area for the Personnel category

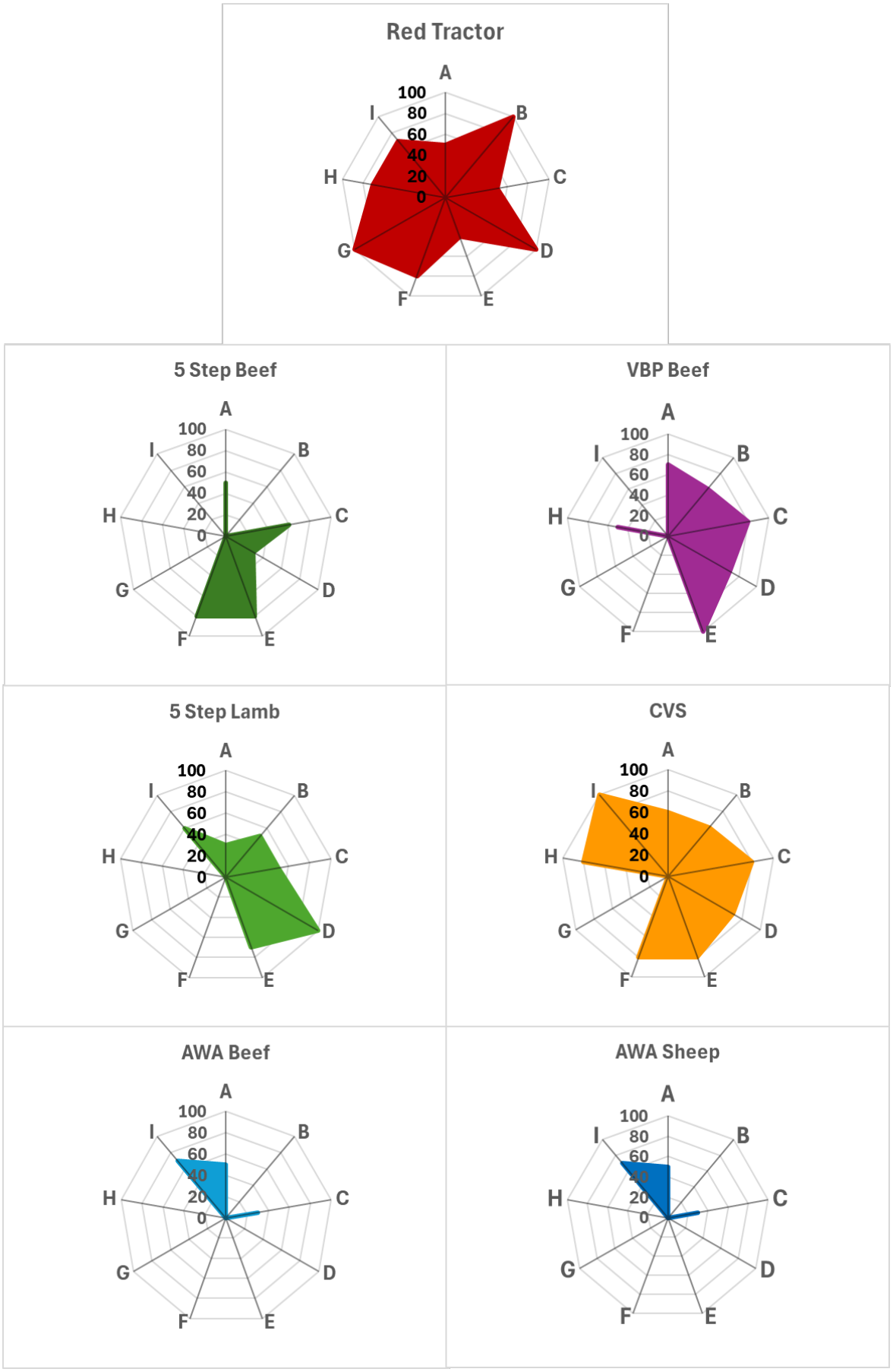


Table 7. Scores for the Personnel category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	66/90	72
Five Step Beef	30/90	34
VBP	43/90	48
Five Step Lamb	36/90	37
CVS	61/90	67
AWA Beef	15/90	16
AWA Sheep	15/90	16

Summary of findings

RT and CVS score highest within the Personnel section. This is primarily because these schemes place a focus on the welfare of personnel and contain additional requirements over those in the other schemes. Both RT and CVS contain relatively detailed requirements around staff competency, observation at work on a regular basis, and the provision of training. The VBP scheme requires some training, as do both Five Step schemes, but the level of detail provided is not high. The AWA schemes do not focus on training. Only RT addresses worker health and safety in any detail.

Red Tractor

RT does not generally require specific qualifications for farm staff, although all staff are required to be competent. Staff training is required for certain, specified activities, but to score higher, the activity list could be expanded to include activities like stock management, animal welfare, record keeping, health and biosecurity management as well as the more obvious chemical handling, and health and safety procedures. All key tasks should be specified and the minimum level of training/qualifications indicated.

It is appreciated that RT has to walk a fine line between continuously developing the standards and remaining acceptable to English farmers, but as a number of experts have pointed out, just because someone has many years of experience in the delivery of a task does not mean that they are delivering it correctly, and that in an ideal world all farmers would have qualifications which cover all tasks which they are delivering.

Five Step Beef

Five Step Beef does not contain specific requirements around training for stock handlers, but does require that they are trained for each task that they deliver. Ongoing training is assumed to be happening by the standard, and is aimed at delivering against Global Animal Partnership standards. Staff induction is not required, external labour providers are not referred to and health and safety of staff is not considered within the scheme.

VBP

VBP is quite specific and requires one person from the beef cattle operation to complete a VBP training programme to ensure that they know how to meet the requirements of the scheme. Some review of performance is required. The scheme also contains requirements around communication and rectification of mistakes, and requires that one person is designated to manage human resources. Staff induction is not addressed. Training records are required, although regularity of training is not discussed, and health and safety of staff is not considered within the scheme. External labour providers are not referred to.

Five Step Lamb

Requirements around training in Five Step Lamb are not as extensive as in many other schemes. Training of all staff is required, but is not clearly specified and the frequency of training is also not clear. A staff induction is not required. External labour providers are not referred to and health and safety of staff is not considered within the scheme.

CVS

The CVS scheme does not require specific qualifications for employees, but does require competence. Staff induction is not required, but workers must be trained and supervised until competent. Annual observation of staff performance at work is required, with corrective training if necessary. Health and Safety of workers is not considered within the scheme. External labour providers are required to be aware of good practice and be updated on key actions and observed during delivery of these actions.

AWA Beef
The AWA Beef scheme requires that all those working with animals are competent. There is no requirement for staff induction, and no training is specified. Health and Safety of workers is not considered within the scheme. External labour providers are not referred to.

AWA Lamb
The AWA Lamb scheme requires that all those working with animals are competent. There is no requirement for staff induction, and no training is specified. Health and Safety of workers is not considered within the scheme. External labour providers are not referred to.

Legislative requirements

Within each region, there is extensive legislation which governs employment. This legislation is not usually specific to agriculture and is normally framed as employment law, covering employment contracts and health and safety at work. The regulations only cover appropriate induction and training from a human safety perspective, they do not cover competency for the tasks that staff are required to deliver, with the exception of the use of potentially dangerous chemicals.

England
The Management of Health and Safety at Work Regulations 1999 require that all employers or the self-employed assess their own risk, and the risk to anyone working for them regarding their working environment. The Health and Safety Executive issued the following guidance for farms:

- be certain that all buildings are kept in good repair and that floors are not overloaded, especially in feed lofts
- provide handrails on stairs and ramps where needed
- make sure there are safety hoops or rest stages on long vertical fixed ladders
- keep all workshops tidy
- equip inspection pits with accessible escape routes and cover pits when not in use
- provide adequate lighting and replace any old lights
- ensure there is good drainage and non-slip flooring for wet areas

Broadly, the RT scheme assesses against legal requirements, but its requirements around training and induction are above legal requirements, as is the requirement to regularly assess employee performance and provide refresher training.

USA
The Occupational Safety and Health (OSH) Act is aimed at ensuring that employees work in a safe and healthful environment by setting and enforcing standards, and by providing training, outreach, education, and assistance. Employers must comply with all applicable OSHA standards. Employers must also comply with the General Duty Clause of the OSH act, which requires that the workplace is kept free of serious recognized hazards.

The legislation covers all workplaces, not just those in agriculture. However, the National Institute for Occupational Safety and Health (NIOSH) has recognised some of the unique challenges in agriculture and has developed an agricultural safety and health programme to address the high risks of fatal injuries and illnesses experienced by workers and families in agriculture. This is the Agriculture, Forestry, and Fishing (AgFF)

Programme. Its priorities are: Conducting research to understand and decrease exposure to hazards that cause disease and injury in AgFF industries; Developing and evaluating control measures and technologies to protect workers; and, producing educational, outreach, and prevention programs to guide workers and employers.

Canada

Health and Safety of people at work is covered by provincial legislation and can differ across Canada. There is, however, a Canada Labor Code which covers the responsibilities both employers and employees at work.

The Canadian Centre for Occupational Health and Safety (CCOHS) is Canada's national centre for occupational health and safety. The CCOHS provides central support for all the regulatory jurisdictions within Canada. In relation to agriculture, COSHH covers all substances hazardous to health including:

- substances used directly in work activities, e.g. cleaning chemicals, disinfectants, fertilisers, many pesticides and veterinary medicines
- substances generated during work activities, e.g. fumes from welding
- naturally occurring substances, e.g. grain dust, poultry dust, silo and slurry pit gases
- biological agents, e.g. bacteria and fungi

Farmers are required to comply with their duties under the Control of Substances Hazardous to Health Regulations 2002 to control exposure to agricultural dusts and protect workers' health.

Food Safety

The Food Safety section was created to test the effectiveness of each assurance scheme in ensuring that food sourced from livestock produced under their schemes are free from contamination by chemicals, tainted food, or physical contaminants such as broken needles. A further requirement is that the food produced from each unit can be traced if a problem is discovered.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Food Safety category:

A. Does the scheme require actions which manage vermin infestation on the farm?
B. Does the scheme require activity to prevent chemical contamination of food?
C. Does the scheme require activity to prevent contamination of food with medicines?
D. Does the scheme require activity to ensure that broken needles or other physical contaminants do not reach the food chain?
E. Does the scheme restrict food types which can be offered to ruminants in order to prevent prion diseases?
F. Does the scheme require dietary restriction of sheep prior to slaughter to prevent contamination during the slaughter and processing process?[5]
G. Is animal traceability robust (cattle)?
H. Is animal traceability robust (sheep)?
I. Is the assurance scheme robust and trustworthy, with adequate audit independence and frequency?

[5] The restriction of access to food for sheep prior to slaughter is important because sheep or lambs which are processed with full bellies of grass or forage present increased risk of contamination of meat as the carcass is disassembled.

Figure 4. Percentage weighted scores for each question area for the Food Safety category

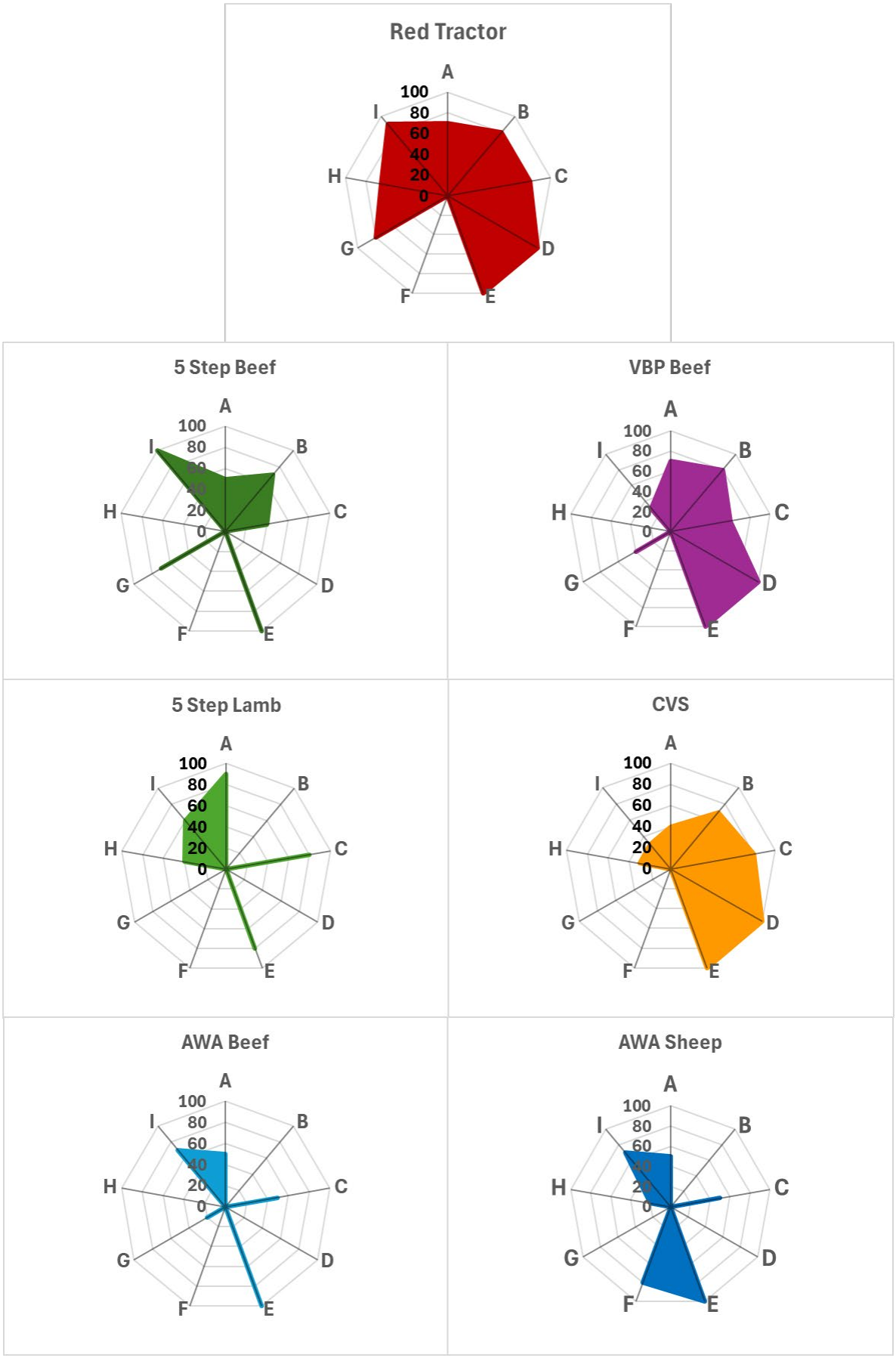


Table 8. Scores for the Food Safety category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	66.5/90	77
Five Step Beef	43/70	61
VBP	48/70	69
Five Step Lamb	35/80	46
CVS	45/80	59
AWA Beef	29/70	41
AWA Sheep	37/80	44

Summary of findings

Within this group of assurance schemes, RT scores highest in terms of food safety, with strong requirements around control of vermin, safe storage of feed and chemicals, and robust traceability. VBP also contains strong requirements around food safety, taking a HACCP based approach. However, the extended audit intervals in this scheme impact its robustness. CVS and Five Step Beef require good record keeping, but only Five Step has frequent farm audits (every 15 months). The other schemes contain less specific requirements and consequently score lower.

Individual scheme findings

Red Tractor

RT requires effective control of vermin as well as the removal of habitat which could harbour vermin close to buildings. An annual site survey is required. Safe storage of feed is required and explained. Scheme traceability is robust.

Five Step Beef

Five Step Beef requires activity to prevent feed contamination by rodents. It also requires that other products such as chemicals and medicines are stored and used appropriately. The scheme does not refer to adherence to withdrawal periods for medicines, but requires veterinary permission for off-label use. Broken needles are not covered within the scheme, but certain feeds are prohibited for ruminants. Producers are required to maintain traceability through individual identification of animals. Regular farm audit takes place (every 15 months).

VBP

The VBP scheme takes a Hazard Analysis Critical Control Point (HACCP) approach to food safety, and auditors will investigate circumstances which they believe could impact food safety. The scheme requires that potential contaminants are safely stored, and that action takes place to minimise the potential for contamination via drug residues or broken needles. Animal feed must be appropriate for ruminants. Traceability requirements in the VBP scheme are weaker than for some of the other schemes. Audit frequency within VBP is low at once every six years.

Five Step Lamb

Five Step Lamb requires the control of rodents, but does not deal in detail with the storage and use of chemicals. The scheme requires tight controls around medicine usage, but does not contain a broken needle policy. Specific foods are prohibited from being fed to ruminants. Traceability is managed on a group basis. Audits take place every 15 months.

CVS

CVS requires that producers control vermin on the farm, and places strong requirements around the storage, management and application of chemicals and other potential contaminants. Medicine usage is well

controlled, and records are required. A broken needle policy is in place. Feed must be appropriate for ruminants. Animal traceability is not as robust as for some other schemes.

AWA Beef

AWA Beef encourages control of vermin, but does not contain any controls around the management of chemicals to prevent contamination. The scheme requires double withdrawal periods for medicines, but does not require a broken needle policy. Only feed which is suitable for ruminants can be offered. Traceability is not as robust as for some other schemes, but audit frequency is high, at once every 12 months.

AWA Lamb

AWA lamb encourages control of vermin, but does not contain any controls around the management of chemicals to prevent contamination. The scheme requires double withdrawal periods for medicines, but does not require a broken needle policy. Only feed which is suitable for ruminants can be offered. Traceability is not as robust as for some other schemes, but audit frequency is high, at once every 12 months.

Legislative requirements

For each country in this study, there is relatively little information on the control of food safety at farm level in any of the food safety legislation, as this is primarily focused on fresh food at the consumption ready stage. The main legislation which is applicable at farm level in each country is the legislation which controls medicine usage and chemical/pesticide usage to avoid contamination of meat with medicines or other chemicals.

England

Within England, food safety is governed by the Food Standards Agency, established by the Food Safety Act 1990 which also provides the framework for all food legislation in England, Wales and Scotland. Traceability is governed by Article 18 of Regulation (EC) No. 1978/2002 and establishes the need and requirements for traceability at all stages of production, processing and distribution.

USA

Food safety in the USA is governed by the Food Safety Modernization Act (FSMA) 2011. The act is governed by the Food and Drug Administration (FDA), which has jurisdiction over domestic and imported foods that are marketed in interstate commerce, except for meat and poultry products. FDA's Center for Food Safety and Applied Nutrition (CFSAN) seeks to ensure that these foods are safe, sanitary, nutritious, wholesome, and honestly and adequately labelled.

The FSMA final rule on produce safety establishes science-based minimum standards for the safe growing, harvesting, packing and holding of fruits and vegetables grown for human consumption. This rule includes information about the feasibility of compliance for farms that rely on grazing animals or working animals. It does not, however, establish waiting periods between grazing and harvest. Each state also has its own agencies and regulations which differ in approach and complexity. In addition, certain state agencies undertake inspections, under contract, on behalf of the FDA.

Canada

The main federal legislation covering food safety is the Food and Drugs Act. This Act prohibits the manufacture or sale of all dangerous or adulterated food products anywhere in Canada.

There are other pieces of legislation which may reference this Act but may stipulate additional requirements such as the *Canada Agricultural Products Act, Meat Inspection Act, Fish Inspection Act, Seeds Act, Fertilizer Act* and *Feeds Act*. Also contributing to the regulatory framework is the *Pest Control Products Act*. As it is understood that animal diseases have the potential to impact the safety of food and products originating from farm animals, the *Health of Animals Act*, administered by the Canadian Food Inspection Agency (CFIA), is also an important piece of legislation to provide further assurance of the safety of the food supply.

Housing and Shelter

The Housing and Shelter section has been designed to ensure that animals produced under each assurance scheme has accommodation which is appropriate to their needs. This includes housing and the provision of appropriate shelter when animals are outside. Housing needs are, generally speaking, equivalent within each of the different countries in the study.

The importance of housing and the provision of shelter is a component of assurance which is growing in importance. Climate change has increased the regularity of extreme weather events in all parts of the world. Within this section, housing design and management is important in all three countries, particularly because of the amount of time which animals can be housed for, and the ability of climatic conditions to create heat stress or pneumonias where ventilation (for example), is not appropriate.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Housing and Shelter category:

A. Is housing well-designed and safe?
B. Does housing promote high welfare?
C. Is housing hygienic?
D. Is there adequate ventilation?
E. Is housing well-lit?
F. Is housing structurally sound?
G. Is there adequate space available for each animal?
H. Are loading and unloading facilities available and to a good standard?
I. Are there appropriate isolation and birthing facilities?
J. Is housing appropriate and safe for stock managers?
K. Do animals outside have access to appropriate shelter?
L. Are animals kept outside kept in appropriate conditions, including well drained lying areas and the absence of severe poaching?
M. Are bedding requirements appropriate?
N. Are the requirements for records appropriate?

Figure 5. Percentage weighted scores for each question area for the Housing and Shelter category

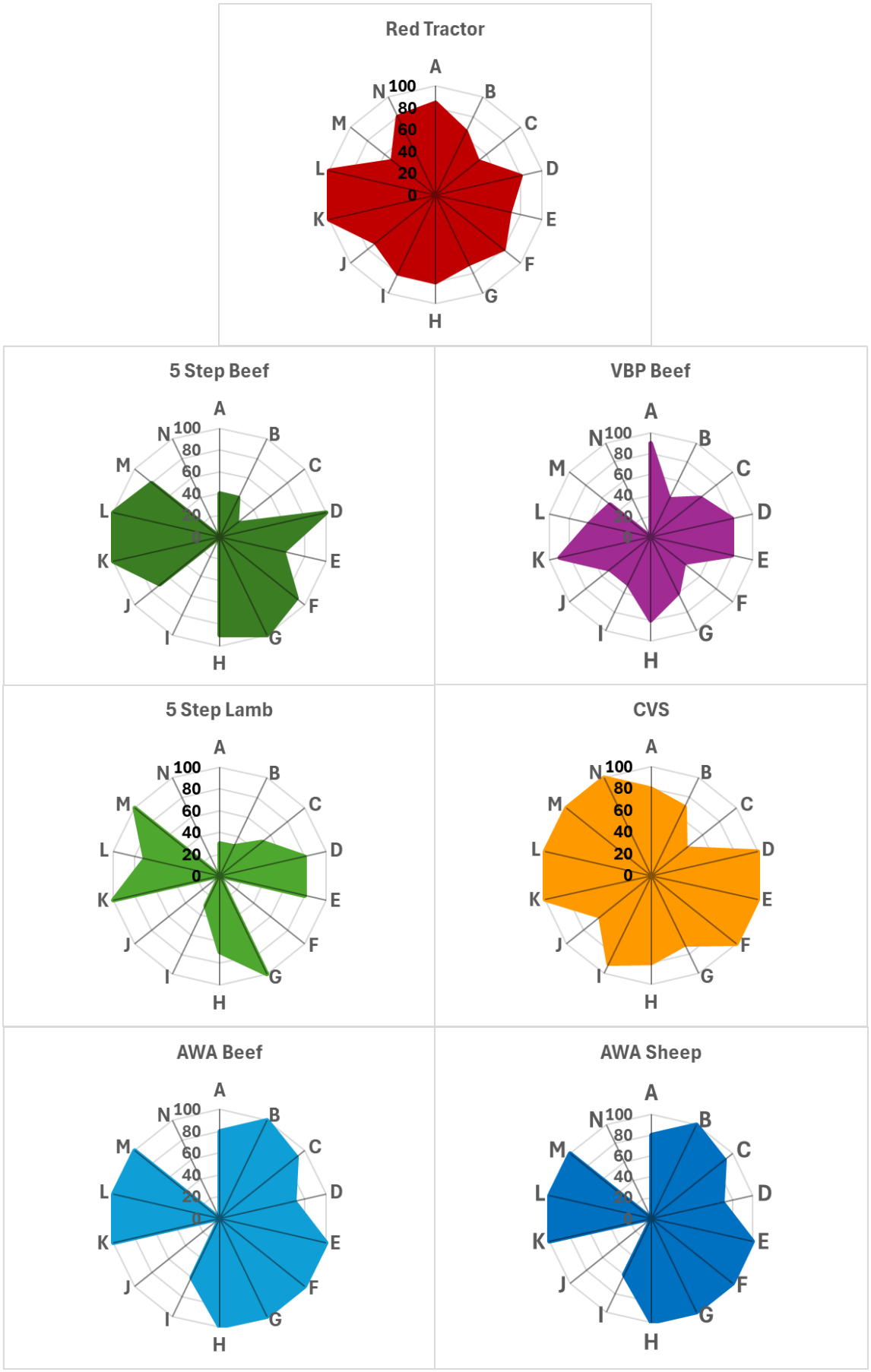


Table 9. Scores for the Housing and Shelter category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	106/140	75
Five Step Beef	89/140	52
VBP	83/140	48
Five Step Lamb	74/140	42
CVS	119/140	70
AWA Beef	110/140	64
AWA Sheep	110/140	64

Summary of findings

RT and CVS scored higher than the other schemes in this section, and the two AWA schemes also scored relatively highly. All of these schemes contain detailed requirements about housing and the conditions in which animals can be kept. The Five Step schemes do not score as well in this section because they are broadly focused on pastoral systems and do not contain high levels of detail around housing. VBP also contains fewer requirements and standards around housing that some other schemes.

Individual scheme findings

Red Tractor

RT achieved the highest weighted score in this category. The scheme requires that housing meets the basic needs of the animal and that the yard is kept tidy, and that cleaning chemicals and necessary equipment are available. The scheme requires appropriate ventilation, avoidance of humidity and odour build up, and a comfortable temperature for animals. The scheme also requires that there is adequate lighting and that housing is structurally sound. Space allowances should be specified and adequate. Loading facilities must be fit for purpose. Bedding is not required, although where bedding is supplied, it must be appropriate.

Five Step Beef

The Five Step Beef scheme requires good housing maintenance, but does not refer to appropriate design. Hygiene is not discussed in detail. Adequate ventilation is required, and must be regularly assessed. There are no requirements around lighting, but housed animals must have continuous access to the outdoors. Extensive space is required for animals confined outside. Loading and unloading facilities are required to be of a good standard and appropriately designed. There is no requirement for isolation and birthing facilities. Housing must be safe for managers. Outdoor animals must have access to shelter (filtering out 50% of solar radiation). Housed animals must be bedded, although bedding records are not required.

VBP

The VBP scheme requires that indoor and outdoor areas for animals are designed and maintained to enable animal comfort. Air quality is required to be high, and housing hygiene must be maintained. Supplementary lighting is required for housed animals. Space allowances must be appropriate, and loading/unloading facilities are required to be well designed and maintained. Shelter is required for animals living outside.

Five Step Lamb

The Five Step Lamb scheme does not contain detailed specifications around housing. Sheep which are housed must have access to the outside, and animals kept inside must have access to enrichment material. There are no requirements around lighting, or housing maintenance. Space allowances should be appropriate. Loading/unloading facilities are not discussed in the standard, and the safety of stock managers is not considered. Animals which are outside must have access to shelter. Housed animals must be bedded with suitable bedding.

CVS

The CVS scheme contains detailed requirements around housing design and maintenance. Good hygiene is required, and good ventilation is required. If ammonia is detected, action must be taken. Adequate space is required for animals that are housed. Loading and unloading facilities are to be appropriate and must allow staff to handle animals in safety. Animals outside must have access to shelter. Housed animals must be bedded with suitable bedding.

AWA Beef

The AWA Beef scheme requires that housing and facilities are designed and maintained to ensure that they are suitable for animals. The scheme requires that animals are kept outside for as long as possible, and only brought in when their welfare could be negatively affected. Housed space allowances are generous, and close confinement is prohibited. Staff safety is not considered. Shelter must be available for animals that are outside. Housed animals must be bedded with appropriate material.

AWA Lamb

The AWA Lamb scheme requires that housing and facilities are designed and maintained to ensure that they are suitable for animals. The scheme requires that animals are kept outside for as long as possible, and only brought in when their welfare could be negatively affected. Housed space allowances are generous, and close confinement is prohibited. Staff safety is not considered. Shelter must be available for animals that are outside, and appropriate bedding must be available for housed animals.

Legislative requirements

England

Within England, the Welfare of Farmed Animals (England) Regulations 2007 requires that any person who employs or engages a person to attend to animals shall ensure that the person attending to the animals:

- is acquainted with the provisions of all relevant statutory welfare codes relating to the animals being attended to
- has access to a copy of those codes while he is attending to the animals
- has received instruction and guidance on those codes

The legislation states that “any person who keeps animals, or who causes or knowingly permits animals to be kept, shall not attend to them unless he has access to all relevant statutory welfare codes relating to the animals while he or she is attending to them, and is acquainted with the provisions of those codes”.

This has application to the housing of animals, and the legislation goes on to state that “the causing of unnecessary pain or unnecessary distress to any livestock on agricultural land is an offence under Section 1(1) of the Agriculture (Miscellaneous Provisions) Act 1968. The breach of a code provision whilst not an offence, can nevertheless be used in evidence as tending to establish the guilt of anyone accused of causing unnecessary pain or distress under the Act (Section 3(4))”.

Consequently, animal housing in England must be appropriate and must not cause discomfort or pain. However, the legislation is non-specific and each incident would be treated on a case-by-case basis.

USA

Most policy regarding the housing and treatment of farm animals is administered by individual states. Farm animals are not covered by the Animal Welfare Act (AWA) 1966, although there are some exceptions. Some states have required that products sold within their state boundaries are from animals raised in the same living conditions as those required of in-state producers.

Canada legislation

Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals, but there are no federal laws protecting animals on farms except in limited cases of cruelty (Canada's Criminal Code).

Specific Code of Practices for all farmed species are established by the National Farm Animal Care Council in conjunction with industry, animal welfare groups and government agencies. These codes are reviewed every five years and updated every ten, and been adopted by many of the federal/provincial/territorial welfare enforcement bodies in Canada. The CVSP is an animal care assessment programme established in keeping with the sheep code.

The Canadian Food Inspection Agency's (CFIA) animal welfare mandate is limited to regulating humane transport of animals and the humane treatment of food animals in federal abattoirs. While producers, along with provincial and territorial authorities, are responsible for the care of animals on farm, the CFIA works to protect farm animals by:

- working closely with the provinces, territories, and all stakeholders in the animal care community when animal welfare issues are identified
- working with industry to establish standards of care and biosecurity
- establishing the requirements to protect all animals during transport
- verifying that humane transport and humane slaughter requirements are respected in all federal slaughter plants.

CCAC guidelines state that animals require sufficient space to rest and exercise, access food and water, and freely express normal postures and behaviours.

Feed and Water

The Feed and Water category questions are designed to test whether the assurance scheme can ensure that cattle and sheep have ready access to appropriate, clean, fresh feed and water, and whether the nutritional needs of the animal are fully met.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Feed and Water category:

A. Do animals have enough feed and water to maintain normal bodily function?
B. Do animals have easy ready access to fresh, clean water?
C. Is the feed offered to animals appropriate?
D. Are the feed storage requirements appropriate?
E. Are Hormone Growth Promoters permitted?
F. Are any types of feed prohibited?
G. Are systems and records in place to prevent livestock being contaminated via feed?
H. Do young animals receive enough colostrum?
I. Is feeding equipment checked regularly and maintained?

Figure 6. Percentage weighted scores for each question area for the Feed and Water category

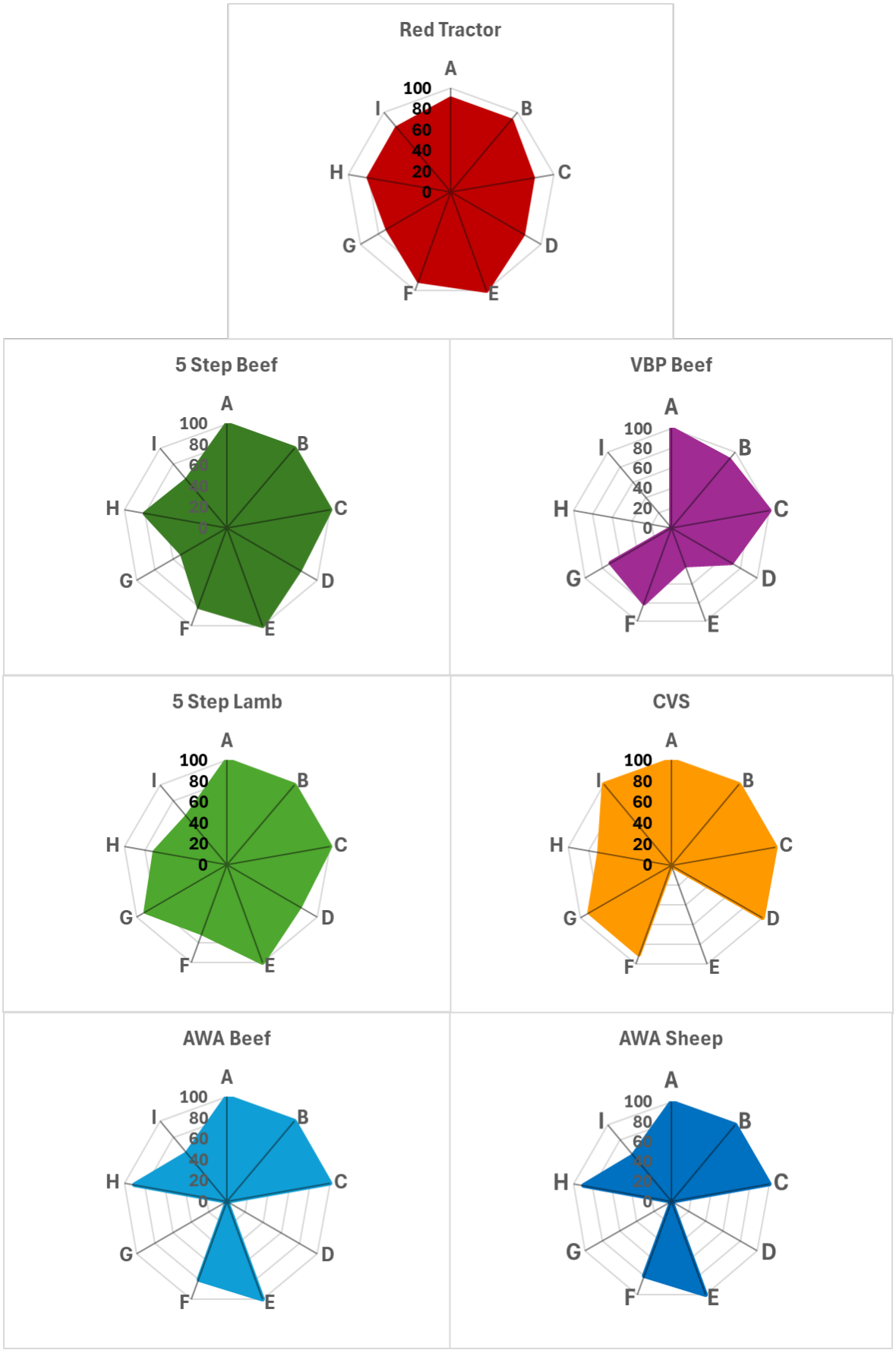


Table 10. Scores for the Feed and Water category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	76/90	85
Five Step Beef	75/90	85
VBP	55/90	63
Five Step Lamb	77/90	87
CVS	75/90	82
AWA Beef	63/90	74
AWA Sheep	63/90	74

Summary of findings

With the exception of VBP, all schemes score highly in this section, covering the provision of clean, fresh and palatable food and water in detail, and emphasising its importance. VBP contained fewer recommendations and guidance around appropriate feeding and as a consequence, its score fell below the others.

Individual scheme findings

Red Tractor

Although RT did not justify full scores in this section, there were no significant gaps and the scheme aims to ensure that animals receive an appropriate diet and have access to enough water. RT specifically considers rumen health. It also requires that food is appropriate to the class of animal, and that the food is stored appropriately to prevent cross-contamination. RT considers the nutritional health of young animals, requiring appropriate access to colostrum.

Five Step Beef

The Five Step Beef scheme contains very clear and appropriate requirements around the provision of the correct amount and composition of feed and water to animals on the farm. The scheme also requires that feed is appropriately stored. Hormone Growth Promoters are not permitted. Actions are required to prevent contamination of feed, and specific feed is prohibited from being offered to ruminants. Five Step Beef considers the nutritional health of young animals, and it requires that the calf remains with its dam until 6 months of age.

VBP

The VBP scheme requires that animals are fed according to their nutritional needs. The scheme contains high levels of detail around appropriate ration formulation. Feed storage requirements are appropriate. Hormone Growth Promoters are permitted under the scheme. Actions are required to prevent contamination of feed, and specific foods are prohibited from being offered to ruminants. Newborn animals receiving colostrum is not discussed.

Five Step Lamb

The Five Step Lamb scheme contains very clear and appropriate requirements around the provision of the correct amount and composition of feed and water to animals on the farm. The scheme also requires that feed is appropriately stored. Hormone Growth Promoters are not permitted. Actions are required to prevent contamination of feed, and specific foods are prohibited from being offered to ruminants. Five Step Lamb requires that young lambs receive colostrum soon after birth.

CVS

The CVS scheme contains very clear and appropriate requirements around the provision of the correct amount and composition of feed and water to animals on the farm. The scheme is highly comprehensive around food storage. Hormone Growth Promoters are not discussed within the scheme. Actions are required to prevent

contamination of feed, and specific foods are prohibited from being offered to ruminants. CVS requires that young lambs are offered colostrum soon after birth if they are removed from their dam.

AWA Beef

The AWA Beef scheme contains very clear and appropriate requirements around the provision of the correct amount and composition of feed and water to animals on the farm. There are no requirements within the scheme to ensure that feed is appropriately stored. Hormone Growth Promoters are not permitted. Actions are required to prevent contamination of feed, and specific foods are prohibited from being offered to ruminants. AWA Beef considers the nutritional health of young animals, requiring that calves receive colostrum within the first six hours after birth, and that artificially reared calves should not be weaned prior to 12 weeks of age.

AWA Lamb

The AWA Lamb scheme contains very clear and appropriate requirements around the provision of the correct amount and composition of feed and water to animals on the farm. There are no requirements within in the scheme to ensure that feed is appropriately stored. Hormone Growth Promoters are not permitted. Actions are required to prevent contamination of feed, and specific foods are prohibited from being offered to ruminants. AWA Lamb considers the nutritional health of young animals, requiring that calves receive colostrum within the first six hours after birth, and that artificially reared lambs should not the weaned prior to 12 weeks of age.

Legislative requirements

As for many of the other categories, the feeding of animals falls under general animal welfare legislation, and also the interpretation of the farm manager and those who enforce the legislation.

England

The legislation governing the provision of food and water is the Animal Welfare Act 2006. It requires that animals must have a suitable diet, including access to water. The Code of Practice for cattle and sheep cover what constitutes a suitable diet in extensive detail. The majority of the RT standard in this case is therefore essentially a less detailed repeat of these Code of Practice. Feed storage *per se* is not generally covered in the legislation, but falls under the concept of clean, fresh and appropriate food. Hormone Growth Promoters are not permitted.

USA

Most policy about the treatment of farm animals is administered by individual states. Farm animals are not covered by the USA Animal Welfare Act (AWA) 1966, and in most cases do not have federal legal protections until they are transported off the farm.

Canada

Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals. There are no federal laws protecting animals on farms except in limited cases of cruelty (Canada's Criminal Code).

Specific Code of Practice for all farmed species are established by the National Farm Animal Care Council in conjunction with industry, animal welfare groups and government agencies. These Codes are reviewed every five years and updated every 10 and been adopted by many of the federal/provincial/territorial welfare enforcement bodies in Canada. The CVSP is an animal care assessment programme established in keeping with the Sheep Code.

There are several guidelines from the Canadian council on animal care (CCAC) which state that mechanical systems that deliver feed and water should be inspected at least daily to ensure that they are in good working condition.

Livestock feeds are regulated under the Feeds Act and Regulations, which are administrated by the Canadian Food Inspection Agency, whose role is to verify that livestock feeds manufactured and sold in Canada or imported are safe, effective and labelled appropriately.

Husbandry Procedures

The Husbandry Procedures section is designed to identify which procedures are permitted under each scheme, and the measures which are taken to protect animal welfare during the procedures.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Husbandry category:

A. Is castration permitted?
B. What age is castration permitted up to without anaesthetic and by what means?
C. What age is castration permitted to with anaesthetic and by what means?
D. Is disbudding permitted?
E. What methods of disbudding are permitted? Is anaesthetic required?
F. What methods of dehorning are permitted? Is anaesthetic required?
G. Is branding permitted? If so, hot branding, freeze branding or both?
H. Is tail docking permitted? If so, what rules govern this?
I. What other miscellaneous procedures are permitted? Are they acceptable?
J. Is mulesing permitted?
K. Who is permitted to carry out each procedure, and what qualifications are required?

Figure 7. Percentage weighted scores for each question area for the Husbandry Procedures category

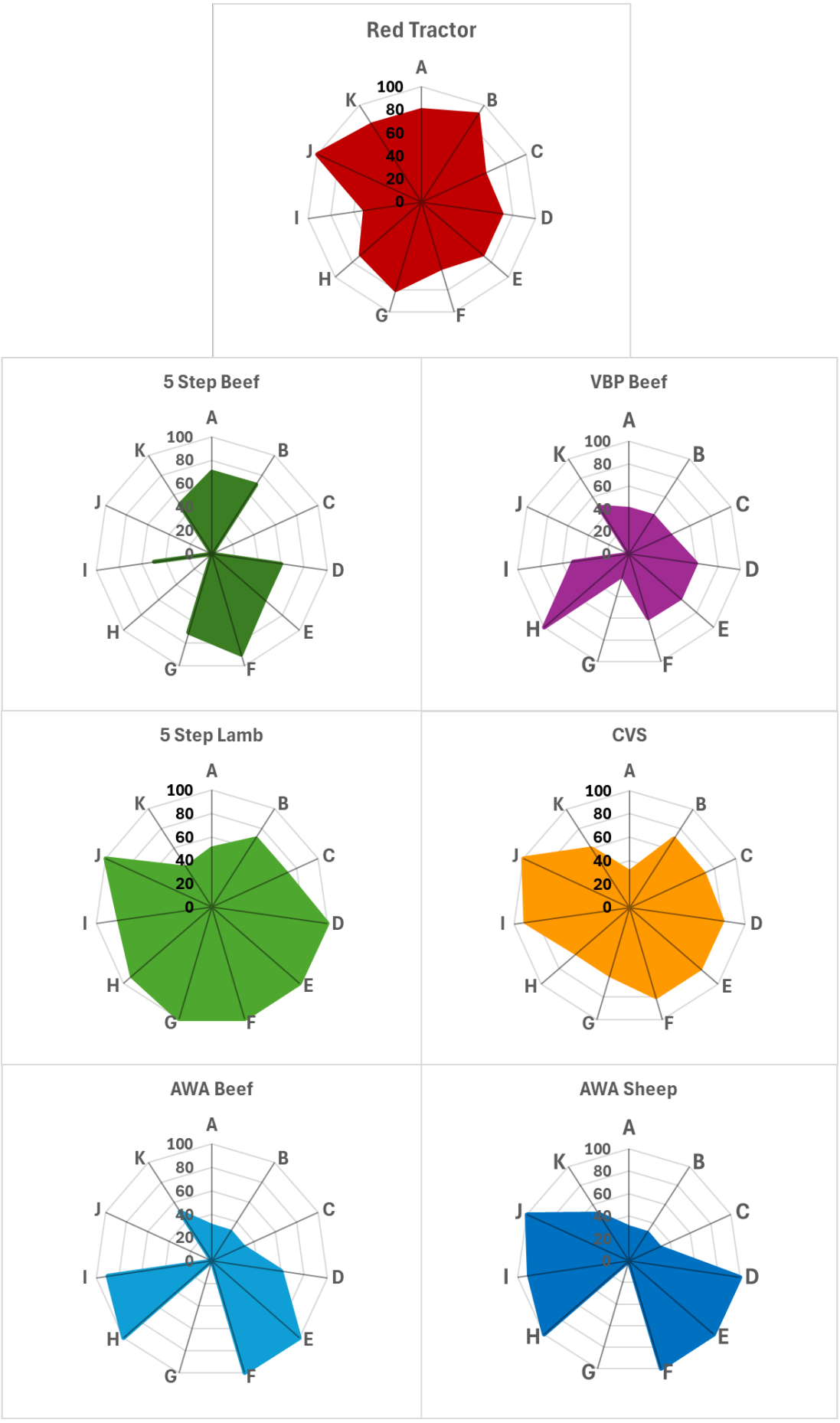


Table 11. Scores for the Husbandry Procedures category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	81/110	74
Five Step Beef	52/100	52
VBP	52/100	52
Five Step Lamb	90/110	82
CVS	78/110	71
AWA Beef	59/100	59
AWA Sheep	73/110	66

Summary

Five Step Lamb scored highest in the husbandry section, mainly because it places tight controls around permissible procedures and the conditions under which these procedures can be delivered. It also requires training for those who deliver the procedures. RT also scores relatively highly, alongside CVS, with both schemes containing clear requirements which control the delivery of husbandry procedures. The other schemes generally permit husbandry procedures to a higher age or contain fewer restrictions than the schemes which score highest.

Red Tractor

RT contains very specific requirements around castration and disbudding procedures. It is prescriptive about what methods are permissible, who can carry out each procedure and the use of analgesics or anaesthetics. Dehorning is permitted but discouraged. Tail docking is not permitted for cattle, unless under specific veterinary direction following trauma or infection

RT has relatively tight age restrictions at which a competent stockperson can deliver husbandry procedures. Beyond these, a vet is required to deliver the procedure, which will have the effect of limiting the number of older animals which undergo these type of husbandry procedures.

Five Step Beef

The Five Step Beef scheme permits castration and applies some controls around this. There is no requirement for the use of anaesthetic up to three months of age. Disbudding is permitted up to six weeks of age, but only with short-term pain relief. Hot branding is prohibited, whilst tail docking is not referred to. The scheme requires training for those who will administer treatment.

VBP

VBP requires that castration and dehorning is done as early as possible. Pain control is required for castration above the age of six months, and also when disbudding after horn-bud attachment. Hot branding is permitted. Competency is required and employees or family members must be trained.

Five Step Lamb

The Five Step Lamb scheme permits castration without anaesthetic below an average age of six weeks (max age eight weeks) for lambs, and requires pain relief above eight weeks. Disbudding is prohibited for sheep, although horn tipping is permitted. All forms of branding are prohibited. Tail docking of lamb is permitted but enough tail must be left to cover the vulva. Laparoscopic AI is prohibited. Mulesing is prohibited. The scheme requires training for those who will administer treatment.

CVS

The CVS scheme discourages castration, but allows it up to the age of 10 weeks of age without anaesthetic. Above this age, anaesthesia and analgesia is required. Dehorning and disbudding are not recommended and are only permitted by a licensed vet. Branding is only permitted if export regulations require this. Farmers and

stock managers are required to be competent in the delivery of husbandry procedures. Mulesing is not permitted.

AWA Beef

AWA Beef permits castration to take place, and the scheme recommends that it should be accompanied by administration of appropriate anaesthetic and/or analgesic. Castration is permitted to two months of age for clamp or surgical and to less than seven days using a rubber ring. Disbudding is permitted to two months of age. Dehorning and tail docking are prohibited. Farmers and stock managers are required to be competent in the delivery of husbandry procedures.

AWA Lamb

AWA Lamb permits castration to take place to the age of seven days and the scheme recommends that it should be accompanied by administration of appropriate anaesthetic and/or analgesic. Dehorning and disbudding is prohibited, although horn tipping is permitted. Tail docking is also prohibited, as is mulesing. Farmers and stock managers are required to be competent in the delivery of husbandry procedures.

Legislative requirements

England

The Welfare of Farmed Animals (England) Regulations 2007 are made under the Animal Welfare Act 2006 and set the minimum welfare standards for all farm animals. It covers standards for stockmanship; health, feed, water and other substances; accommodation; equipment; management; fire and other emergency precautions; pregnancy, rearing, and breeding.

Under the Protection of Animals (Anaesthetics) Act 1954, as amended, it is an offence to disbud calves or dehorn any cattle without the use of an anaesthetic other than when chemical cauterisation is used. In England, the use of a rubber ring, or other device to restrict the flow of blood to the scrotum is only permitted without an anaesthetic if the device is applied during the first week of life. The Protection of Animals (Anaesthetics) Act 1954 makes it an offence to remove a supernumerary teat from a calf which has reached three months of age without the use of an anaesthetic.

USA legislation

Most legislation within the USA regarding husbandry procedures is covered under state, and not federal legislation. In 37 states the most common practices such as tail docking and castration without anaesthesia are exempt from the definition of cruelty, unless specifically prohibited in the state.

There is also little or no legislation governing the use of antibiotics in the USA, although due to consumer interest, the Food and Drug Administration (FDA) has issued guidance implementing voluntary plans to phase out the use of medically important antibiotics in livestock for production purposes.

Canada legislation

In Canada there is no federal legislation that addresses the welfare of animals on the farm. The National Farm Animal Care Council (NFACC) produces Code of Practice for the care and handling of farm animals, which detail non-regulatory requirements and recommendations for good animal care on farms.

Specific Code of Practices for all farmed species are established by the National Farm Animal Care Council in conjunction with industry, animal welfare groups and government agencies. These Codes are reviewed every five years and updated every 10, and been adopted by many of the federal/provincial/territorial welfare enforcement bodies in Canada. The CVSP is an animal care assessment programme established in keeping with the Sheep Code.

Canadian Council on Animal Care (CCAC) guidelines in terms of husbandry state that cattle housed indoors should be checked at least twice daily for injuries, especially to the legs and neck. The reasons for these injuries should be investigated and corrected.

Youngstock Management

Youngstock Management was included due to its critical importance to the long-term health of the animal. The conditions under which animals are farmed can differ substantially between the countries in this report.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Youngstock Management category:

A. Do animals have comfortable and safe indoor accommodation?
B. Is there adequate fresh air?
C. Is there adequate clean water?
D. Is there adequate bedding?
E. Do animals have access to appropriate amounts of feed?
F. Is there adequate light?
G. Is there adequate darkness?
H. Is there an absence of unnecessary and painful husbandry procedures?
I. Are animals able to safely and easily access feed and water?
J. Are animals permitted to be kept on their own when very young?
K. Are animals permitted to be kept on their own when older?
L. Is the animal's diet nutritious and appropriate?

Figure 8. Percentage weighted scores for each question for the Youngstock Management category

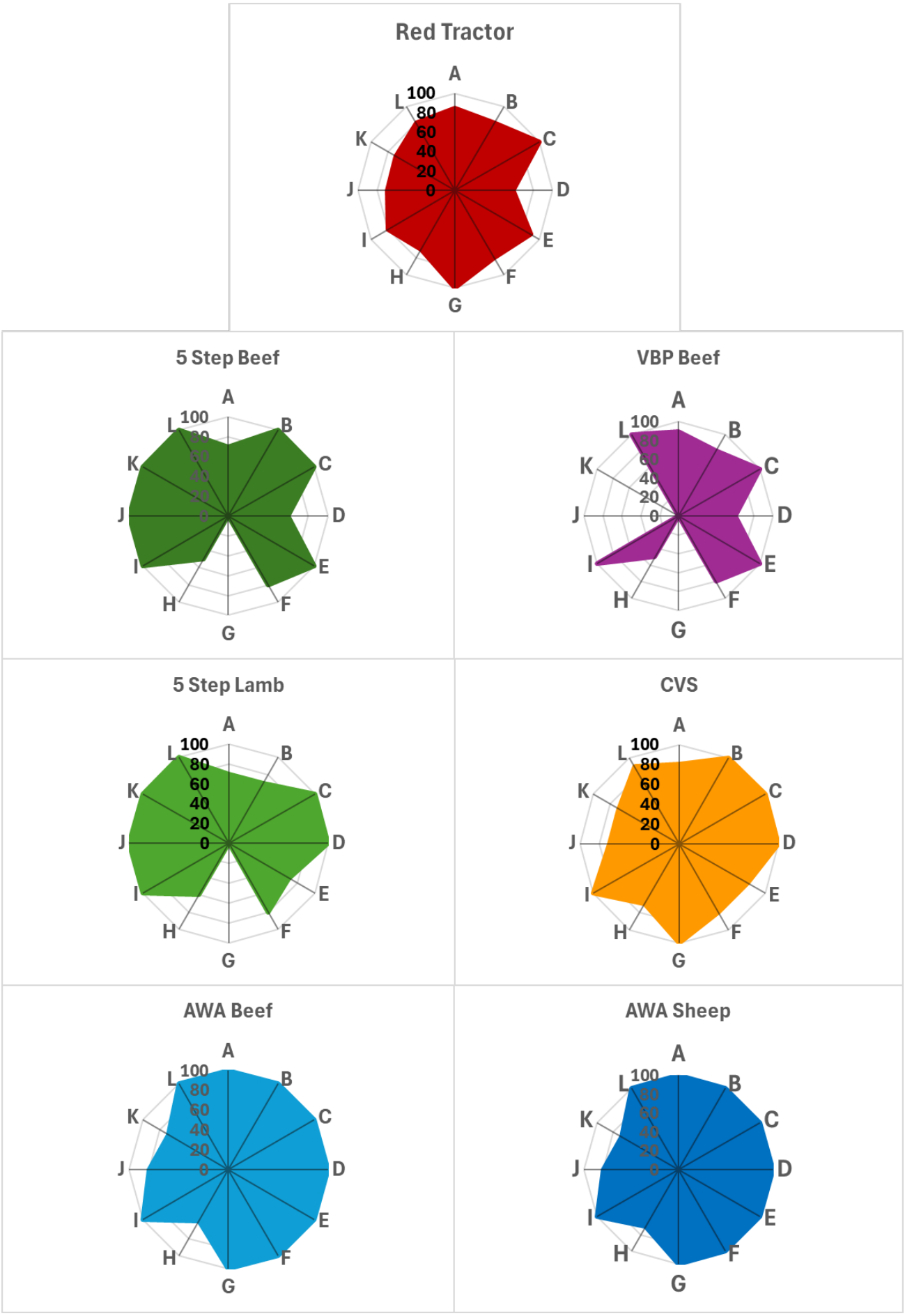


Table 12. Scores for the Youngstock Management category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	96.5/120	81
Five Step Beef	96/120	80
VBP	76/120	68
Five Step Lamb	95/120	79
CVS	104/120	87
AWA Beef	111/120	93
AWA Sheep	112/120	94

Summary of findings

With the exception of VBP, all schemes score highly in this section, with each scheme containing specific requirements around the management of youngstock, that they receive appropriate nutrition, that accommodation is appropriate and that they have social contact with other animals. VBP falls below the other schemes by containing fewer requirements around nutrition of very young animals.

Individual scheme findings

Red Tractor

RT contains information specific to youngstock, requiring that housing must be effectively ventilated, at a comfortable temperature, and without high humidity or odour build up. Artificially reared youngstock must be provided with unrestricted access to clean fresh drinking water. Guidance around husbandry procedures is clear and adequate. Calves must not be housed in individual hutches after eight weeks of age.

Five Step Beef

Good housing maintenance is required, but animals are also required to have access to the outdoors at all times. Air quality must be regularly assessed within housing, and animals must have free and continuous access to drinking water. Bedding is required for housed animals. Animals must have access to appropriate amounts of feed and water which provides optimal nutrition at each specific stage of life. Young animals are to be kept with their dam and animals should be kept in their social groups.

VBP

Good housing design and maintenance is required by the scheme, along with good indoor air quality and ventilation. Cattle must be fed to nutritional need and have access to palatable water. Bedding is not specifically required, but is to be of good quality if used. Appropriate lighting must be used within housing. There are no specifications around required periods of darkness. Young animals and other animals are permitted to be kept on their own.

Five Step Lamb

Five Step lamb focuses primarily on ensuring that animals are kept outside, so does not contain in depth requirements around housing design and maintenance. If animals are to be housed, they are to be bedded with appropriate material. Periods of light and darkness are not specified, but housed animals must have access to the outdoors. Young animals need to be kept with their dam and should be group housed.

CVS

The scheme requires well designed and maintained accommodation. Air quality must be good, and action is required if the quality becomes inadequate. Animals must have daily access to water, and appropriate feed must be offered. If animals are housed they must be bedded. Animals must have a natural daylight cycle, with a minimum of 6 hours of darkness per day. Sheep must have visual contact with other sheep.

AWA Beef

AWA Beef requires that housing and facilities must be designed and maintained to ensure that animals are safe. Housing must be well ventilated and have low levels of ammonia. Animals must have access to water at all times and must also have access to appropriate nutrition. Housed animals must be bedded. Housing must allow natural light to enter, and a minimum of eight hours of darkness is required. Animals can be kept on their own but must have contact with other animals.

AWA Lamb

AWA Lamb requires that all housing and facilities must be designed and maintained to ensure that animals are safe. Housing must be well ventilated and have low levels of ammonia. Housed animals must be bedded. Animals must have access to water at all times, and must also have access to appropriate nutrition. Housing must allow natural light to enter, and a minimum of eight hours of darkness is required. Young animals are not permitted to be kept on their own. Older animals can be kept alone, but this is discouraged.

Legislative requirements

In general, legislation in each jurisdiction considers the welfare of all animals, rather than that of youngstock specifically, and therefore provisions within farm assurance schemes help ensure that the proper care and attention is given to this specific category.

England

Within England, legislation does not differentiate youngstock from mature stock in most incidences. The Codes of Practice for the management of cattle and sheep do describe the required nutrition for younger stock and the necessity of them receiving adequate levels of colostrum inside the first few hours of birth and appropriate ongoing nutrition.

EU Directive 2008/119/EC, which is part of English legislation lays down minimum standards for the protection of calves, including housing and research that should be conducted into efficient stock-farming systems.

USA legislation

Within the USA, there is no separate legislation for youngstock.

Canada legislation

In Canada there is no separate legislation for youngstock.

Animal Health and Welfare

The Animal Health and Welfare category was included within our assessment because, outside of food safety, this is the area which is of most importance to consumers[6]. The questions in this section have been designed to identify if the various assurance schemes promote good animal health and enable the animals to experience conditions which promote high welfare.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Animal Health and Welfare category:

A. Are animal welfare scoring/outcome measures required?
B. How effective is each welfare score?
C. How regularly are welfare scoring measures required to be taken?
D. Are welfare measures reported to external organisation?
E. Is a Veterinary Health Plan required and accessible to staff?
F. Is the plan active?
G. Are medicine records fully up to date?
H. Does the scheme require isolation facilities in a separate air space?
I. Is locomotion scoring required?
J. Is body condition scoring required?
K. Is a review of the Veterinary Health Plan required?
L. Is it a requirement to regularly monitor the health of stock? How often? How often is a vet visit required?
M. Are miscellaneous circumstances, including euthanasia, well managed, and equipment controlled to maintain high welfare?
N. Are staff appropriately trained? Is a competent individual available?

[6] AHDB/Blue Marble, 2022

Figure 9. Percentage weighted scores for each question for the Animal Health and Welfare category

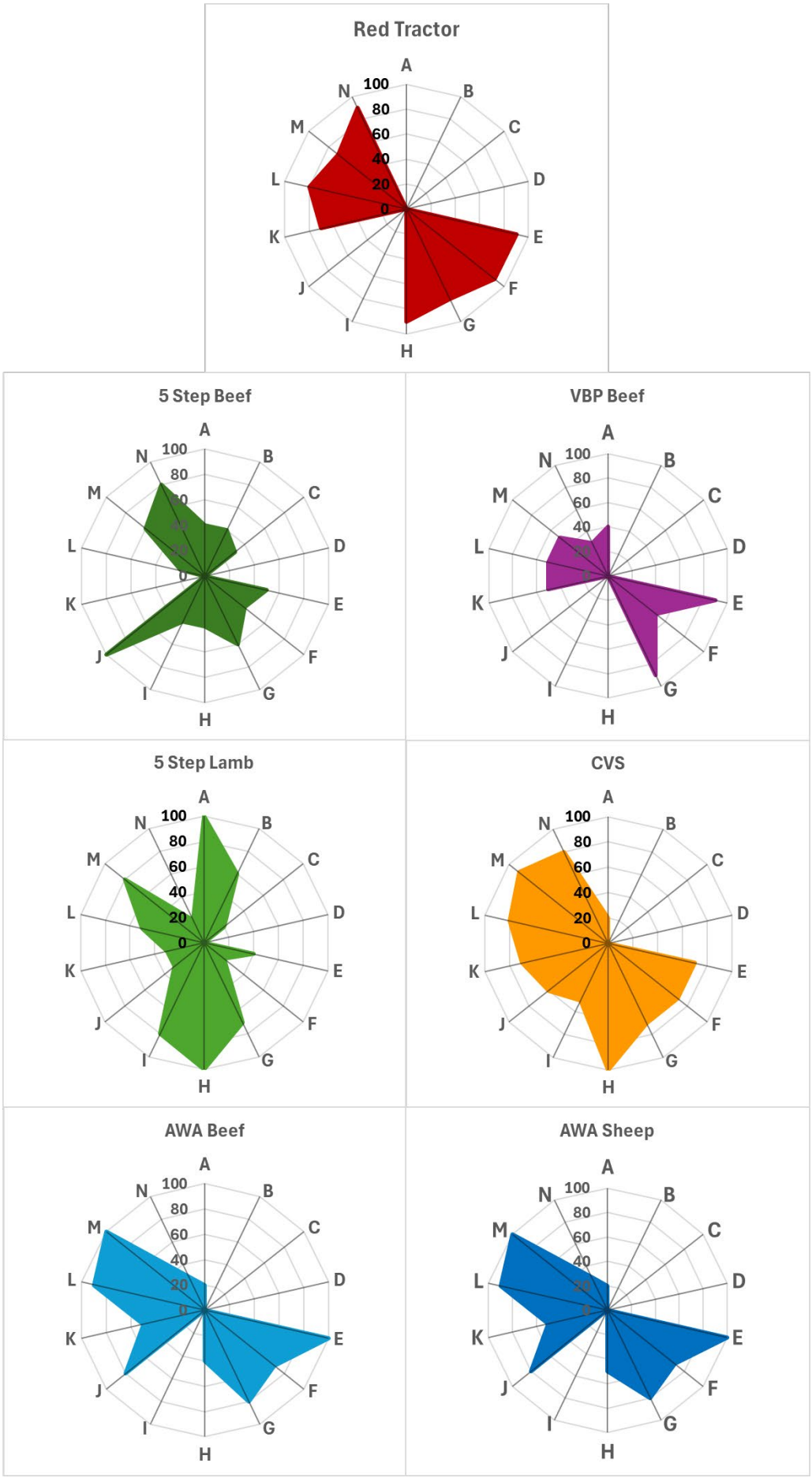


Table 13. Scores for the Animal Health and Welfare category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	66/140	59
Five Step Beef	60/140	43
VBP	45/140	38
Five Step Lamb	70/140	50
CVS	76/140	61
AWA Beef	66/140	53
AWA Sheep	67/140	54

Summary of findings

The CVS scheme scores highest in relation to Animal Health and Welfare. Both it and RT schemes cover relatively high levels of detail, specifically requiring active Vet Health Plans and appropriately trained staff. CVS requires lameness monitoring and body condition scoring – both useful for maintaining the health of a flock. The AWA and VBP schemes score lower because they display an absence of focus on training of staff around the management of health and welfare.

Individual scheme findings

Red Tractor

RT has a clear focus on the maintenance of health and welfare of animals. It scores towards the top of this section because it is comprehensive and covers multiple areas. It requires daily checks for animal health (twice daily when housed), and inspects against the availability of feed and water. RT does not require specific animal welfare scoring or the reporting of outcome measures but does use records of animal health recording to assess activity within a health plan. RT does require a Veterinary Health Plan that is active and up to date. This plan must identify all key individuals responsible for livestock management and welfare, and be available to all staff. Medicine records are appropriate, and staff must be adequately skilled and able to demonstrate competency.

Five Step Beef

The Five Step Beef scheme does not require welfare scoring, body condition scoring or locomotion scoring, but it does require that less than 2% of the herd are lame at any one time. The scheme does not require specifically that a Veterinary Health Plan is in place, but a Whole Ranch Plan is required, which does include health planning. Medicine records are required to be kept up to date, some actions are required to monitor stock health and there are detailed requirements around the maintenance of high welfare. The scheme contains strong requirements around the training of staff.

VBP

The VBP scheme does not require welfare scoring, body condition scoring or locomotion scoring but does required a documented Herd Health Plan. There is an implicit requirement within the scheme that this plan is kept up to date, but this is not as clear as it should be. The scheme requires that detailed medicine records are kept. Cattle must be monitored for illness and injury on a regular basis, and euthanasia is well controlled. Training requirements of staff are not as detailed as for several other schemes.

Five Step Lamb

The Five Step Lamb requires body condition scoring on at least an annual basis, and also requires that lameness is monitored, and that less than 5% of the herd are lame at any one time. A Veterinary Health Plan is not specifically required, but health planning is a requirement of an overall Farm Plan. Medicine records must

be kept up to date, some actions are required to monitor stock health. Staff training requirements are not described.

CVS

The CVS scheme requires the monitoring of sheep for lameness, and annual body condition scoring. A Veterinary Health Plan is required, and this contains detailed requirements around actions that should be taken. The plan is required to be active. The scheme also specifies a range of control mechanisms to maintain high health and welfare. Staff training requirements in this scheme are relatively strong.

AWA Beef

The AWA Beef scheme does not require welfare scoring, but does focus on the need for management of animals to promote health rather than just to treat disease. An active Veterinary Health Plan is required, and cattle must be inspected at least once per day. There are few requirements in the scheme about competency or training around the management of animal health and welfare.

AWA Lamb

The AWA Lamb scheme does not require welfare scoring, but does focus on the need for management of animals to promote health rather than just to treat disease. An active Veterinary Health Plan is required, and cattle must be inspected at least once per day. There are few requirements in the scheme about competency or training around the management of animal health and welfare.

Legislative requirements

England

The Welfare of Farmed Animals (England) Regulations 2007 sets the minimum welfare standards for all farm animals. It covers standards for stockmanship; health, feed, water and other substances, accommodation, equipment, management, fire and other emergency precautions, pregnancy, rearing, and breeding. England also provides animal welfare Code of Practice which guide farmers on the most appropriate practice to deliver good animal welfare.

Under The Protection of Animals (Anaesthetics) Act 1954, as amended, it is an offence to disbud calves or dehorn any cattle without the use of an anaesthetic, other than when chemical cauterisation is used.

USA

There are no federal animal welfare laws regulating the treatment of livestock while they are on farm. The animal welfare act regulates the treatment of animals in research, teaching, testing, exhibition, transport, and by dealers. However, it excludes the protection of farm animals.

Canada legislation

Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals. All provinces and territories have laws to ensure animal welfare, and the Criminal Code of Canada prohibits anyone from wilfully causing animals to suffer from neglect, pain or injury.

Animal Medicines

The Animal Medicines category was created to assess the quality of the scheme's requirements around control of the use of medicines, ensuring that they are used effectively and that they cannot enter the food chain.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Animal Medicines category:

A. Is medicine usage and administration appropriate?
B. Are movement documents required which show what animals have been treated and their withdrawal periods?
C. Are withdrawal periods appropriate and adhered to?
D. Are medicine storage, handling, use and disposal of a good standard?
E. Is responsible antibiotic use required and assured?
F. Are critically important antibiotics prohibited or permitted?
G. Is a central monitoring system required to permit the use of antibiotics?
H. Is sensitivity testing required prior to use?
I. Is off-label (cascade) use of veterinary medicine permitted?
J. Is a broken needle policy and records required?
K. Is the person administering medicines competent?
    a. How is this assured?
L. Are detailed medical records required (including purchase records and broken needle records)?

Figure 10. Percentage weighted scores for each question area for the Animal Medicines category

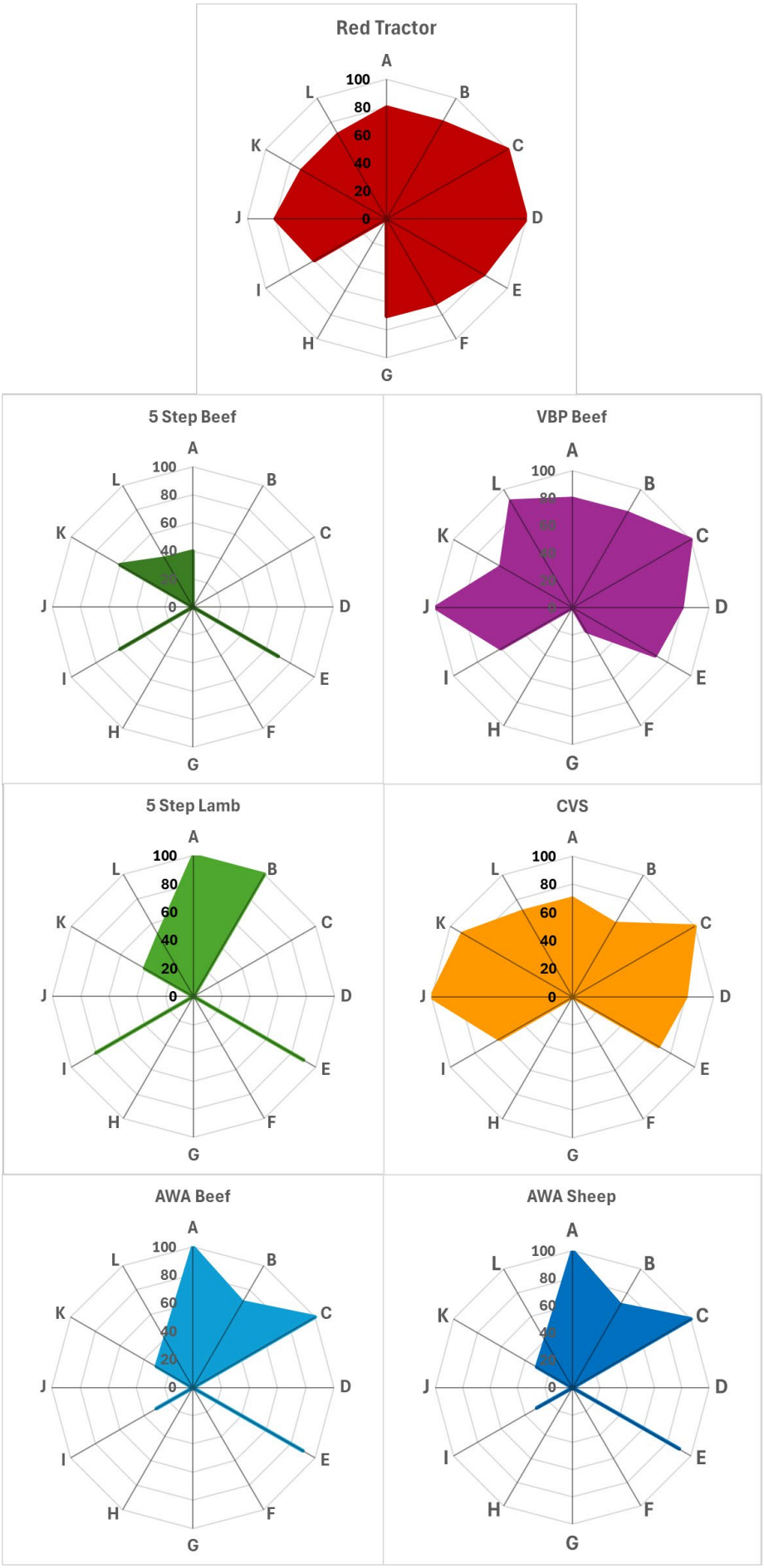


Table 14. Scores for the Animal Medicines category

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	86/120	77
Five Step Beef	27/120	23
VBP	74/120	66
Five Step Lamb	46/120	39
CVS	70/120	62
AWA Beef	46/120	41
AWA Sheep	46/120	41

Summary of findings

RT obtains the highest score because it contains strong requirements around the storage, control, use and recording of animal medicines. VBP and CVS also have relatively high levels of detail on the same topics, but the other schemes in this study contain fewer requirements, as well as requiring lower levels of staff training. Many of the schemes do not contain the requirement for a broken needle policy.

Individual scheme findings

Red Tractor

RT achieves the highest score in the Animal Medicines section and requires relevant experience or training for those who are administering the medicine, and that withdrawal periods are carefully adhered to. RT requires a good level of detailed management and recording and requires appropriate training or experience for staff that are administering medicines.

Five Step Beef

The Five Step Beef scheme contains very little guidance around the appropriate use of medicine, and withdrawal periods are not covered. Medicine storage is also not addressed in the scheme. Antibiotic use is permitted, but sensitivity or diagnostic testing is not required prior to administration. However, animals which are treated with antibiotics cannot be sold under the Five Step programme. Central monitoring of antibiotic use does not take place. A broken needle protocol is not specified. Medicine records are required, but these are not as clearly specified as in some other schemes,

VBP

The VBP scheme requires that medicine is used appropriately, and that good record keeping is maintained. However, VBP does allow batch treatment and recording of medicinal treatment at a group level rather than at an individual level. Antibiotic use is permitted within the scheme and is subject to appropriate controls, although critically important antibiotic use is not specified. Central monitoring of use does not take place. A broken needle policy is required. There are some requirements around staff competency with regard to use of medicines.

Five Step Lamb

Five Step Lamb requires the use of medicines to be controlled within an overall plan. Detailed records are required, and antibiotic use is permitted, but animals which are treated with antibiotics are not allowed to be sold under the Five Step brand. Central monitoring of use does not take place. A broken needle protocol is not specified. Medicine records are required, but these are not as clearly specified as in some other schemes.

CVS

CVS specifies some controls around the use of medicines and antibiotics, and requires detailed medical records to track treatment. Withdrawal periods are discussed, and appropriate requirements are applied. Antibiotic use is permitted. Central monitoring of use does not take place. A broken needle policy is required. The scheme has detailed competency and training requirements for those who are administering medicines.

AWA Beef

The AWA Beef scheme contains strong requirements around the use of medicine. Very detailed records are required, and double the recommended withdrawal periods are required following the application of medicine. Antibiotic use is permitted, but treated animals cannot be sold under the AWA brand. Central monitoring of antibiotic use is not required. A broken needle policy is not discussed. Competency is required of those who are administering treatments, although limited instructions are provided around this.

AWA Lamb

The AWA Lamb scheme contains strong requirements around the use of medicine. Very detailed records are required, and double the recommended withdrawal periods are required following the application of medicine. Antibiotic use is permitted, but treated animals cannot be sold under the AWA brand. Central monitoring of antibiotic use is not required. A broken needle policy is not discussed. Competency is required of those who are administering treatments, although limited instructions are provided around this.

Legislative requirements

Animal medicine usage is controlled in all regions by country (or state) regulations. The rules around the use of medicines which are permitted, what they may be used for etc., are almost all legislative, and the assurance schemes simply reflect this. The use of medicines in all each jurisdiction is permissible even by those who are not professionally trained.

England

In England, keeping accurate records of medicine use on farms is a legal requirement. The owner or keeper of food-producing animals must maintain records related to the purchase of all veterinary medicine products. These records should be kept for a minimum of five years. The following information needs to be recorded: Name of the product and its batch number; Date of acquisition; Quantity acquired; Name and address of the supplier.

When administering medicine, farmers must record: Name of the product; Date of administration; Quantity administered; Withdrawal period; Identity of the treated animal(s). If a vet administers the medicine, they must also record the batch number and their name in the farm's records or provide this information in writing for the farmer to enter. If the farm disposes of a veterinary medicine (other than by treating an animal), the following must be recorded: Date of disposal; Quantity of product involved; Details of how and where it was disposed of.

There are four levels of treatment of antibiotics for veterinary use in England[7];

1. Category A: Antibiotics in this category are not authorised as veterinary medicines in the EU and should not be used in food-producing animals. They may be given to companion animals under exceptional circumstances
2. Category B: Antibiotics in this category are critically important in human medicine and use in animals should be restricted to mitigate the risk to public health and should be considered only when there are no antibiotics in Categories C or D that could be clinically effective. Their use should be based on antimicrobial susceptibility testing, wherever possible
3. Category C: For antibiotics in this category there are alternatives in human medicine. For some veterinary indications, there are no alternatives belonging to Category D. Category C antibiotics should be considered only when there are no antibiotics in Category D that could be clinically effective
4. Category D: Antibiotics in this category should be used as first line treatments whenever possible. Again, they should be used prudently, and only when medically needed

[7] NOAH Technical Briefing: Categorisation of Antibiotics and Updated Guidance to Support Responsible use and UK Animal Health and Welfare

Within England the Veterinary Medicine regulations have been updated recently. These regulations set out the controls on the marketing, manufacture, distribution, possession and administration of veterinary medicines. The main changes for farm animal veterinary surgeons include the fact that anyone selling medicines online will need to be registered to ensure they are compliant with medicine laws, including the responsibility for safe storage of medicines until they arrive with the customer. From November, vets, pharmacists and SQPs must record the reason for prescribing a POM-V/POM-VPS product. The prescriber now has a duty to give the withdrawal period information to the owner in a particular way, and there are new calculations to work out what safe usage limits are. Subject to the professional obligations of a veterinary surgeon to ensure the health and welfare of animals under their care, antibiotics may not be used routinely, prophylactically to compensate for poor hygiene, inadequate husbandry or poor farm management practices. It is now a specific criminal offence to promote breach of the cascade – a series of steps that a vet legally has to follow if they want to use medicines which are not licensed for that particular purpose in that particular species of animal.

USA

Animal medicines in the USA are strictly regulated by the Food and Drug Administration, and must follow a rigorous approval process. Once approved, they remain heavily regulated and are subject to strict laws. Additional inspections and reviews are carried out after approval including inspections of the manufacturing facilities and regulations are also applied to product labels and promotional materials to ensure accuracy.

The approvals process classifies the drug as prescription, over-the-counter, or veterinary feed directive, which places restrictions on how the drug can be obtained.

Canada

Veterinary drugs in Canada are regulated under the Food and Drugs Act, and regulations from Health Canada. To be approved, evidence must be provided to the Veterinary Drugs Directorate (part of Health Canada) to prove the drug is safe for the animals that will be treated, safe for humans (if used in food-processing animals), effective at treating the condition for which it is approved, and of high quality. Once approved, animal medicines are monitored to ensure their continued safety.

Biosecurity and Disease Control

There is a genuine importance to the prevention of the spread of disease. This has traditionally been an area where beef and sheep farms have underperformed[8] in comparison to other sectors such as pig and poultry. Beef and lamb farms have fewer restrictions about who can enter and have contact with animals, combined with the transport of animals to and from market and the lack of isolation of newly purchased animals. Farm assurance can play a key role in improving biosecurity practice. Strong biosecurity requirements in farm assurance schemes can encourage better animal health and welfare, as well as improved animal performance through drawing the attention of the farmer to the importance of good practice.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Biosecurity and Disease Control category:

A. Does the scheme require the creation of a Biosecurity Plan?
B. Does the scheme check adherence to the Biosecurity Plan?
C. Does the scheme require updating of the Biosecurity Plan?
D. Does the scheme require a known health status for animals brought onto the farm?
E. Is there a record of people, vehicles and machinery entering the farm?
F. Does the scheme require appropriate cleaning material to be available on-farm?
G. Does the scheme require appropriate activity to deliver good biosecurity?

[8] Cennydd Owen Jones et al, *'Biosecurity in UK Livestock Farms: An Insight Into current Practice'* Jan '23

Figure 11. Percentage weighted scores for each question area for the Biosecurity and Disease Control category

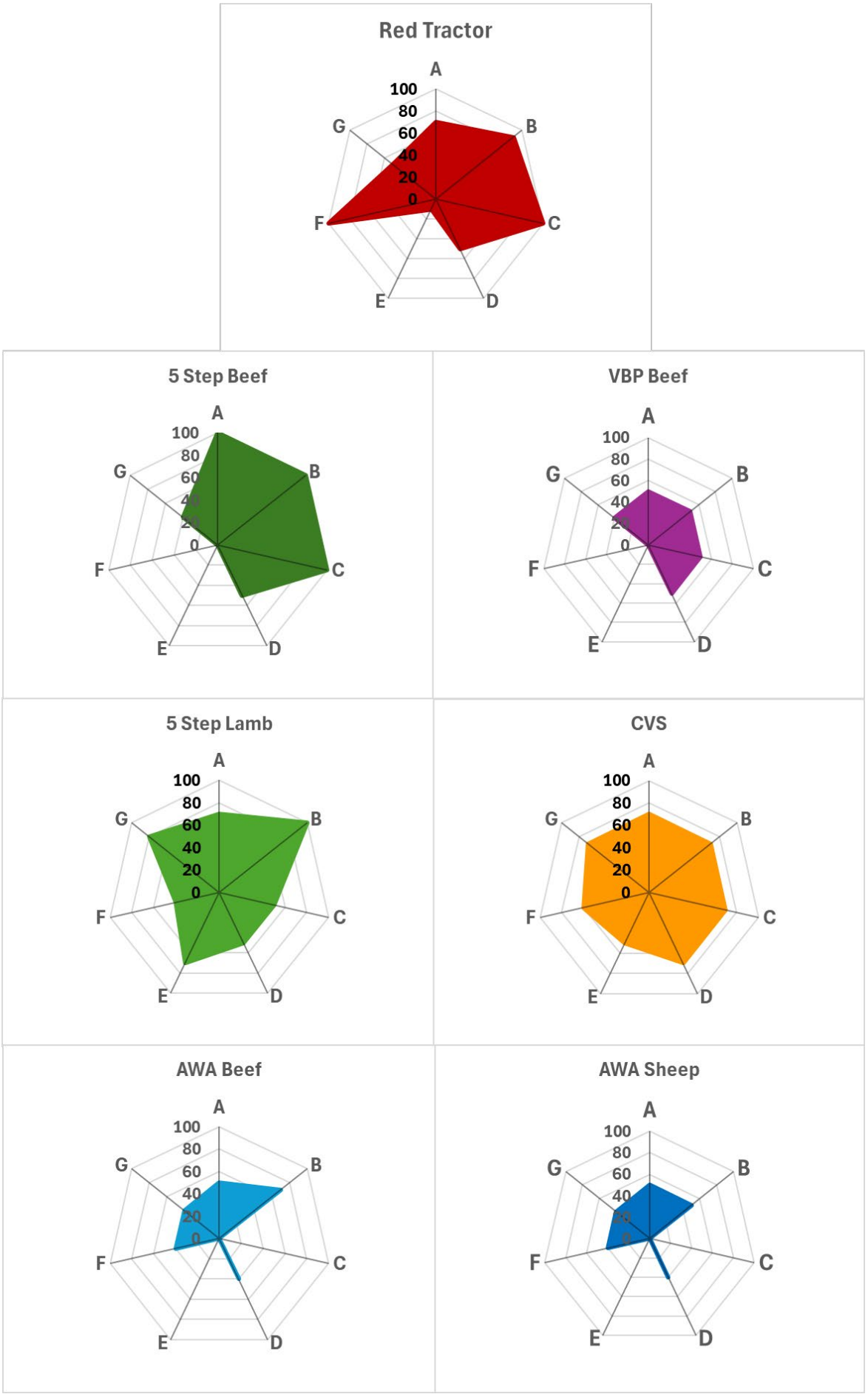


Table 15. Scores for the Biosecurity and Disease Control category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	47/70	67
Five Step Beef	39/70	59
VBP	24/70	37
Five Step Lamb	46/70	66
CVS	46/70	67
AWA Beef	24/70	37
AWA Sheep	22/70	34

Summary of findings

There is strong variability in how the schemes perform in this area. RT, Five Step Beef, Five Step Lamb and CVS all require the creation of an active Biosecurity Plan, and that it is kept up to date. Other concepts such as hygiene and isolation procedures are covered by these schemes, but none require a known health status for animals being brought onto the farm. The other schemes score lower, and do not specifically require Biosecurity Plans and do not contain high levels of detail around control procedures to prevent transmission of disease onto each unit.

Individual scheme findings

Red Tractor

The RT scheme requires the creation of a detailed Biosecurity Plan, and assesses adherence to this plan as well as how up to date it is. The scheme requires appropriate activity to deliver good biosecurity. The scheme does not require a visitor book to record details of those who visit the farm. RT does not specify how key biosecurity risks should be mitigated, and although it requires approved cleaning chemicals to be present, it does not require their use. It also does not require that the health status of incoming animals is known, which is a very significant weakness. RT also does not assess the appropriateness of the Biosecurity Plan – it will simply inspect against the plan.

Five Step Beef

Five Step Beef requires the creation of a Biosecurity Plan, as well as its ongoing implementation. It requires that the plan is updated whenever there are changes to farm practice or structure. The scheme does not require a known health status for animals brought onto the unit, but does require that other measures are taken to avoid the introduction of disease from outside sources, including stock, visitors and vehicles.

VBP

The VBP scheme recommends but does not require the development and implementation of a Biosecurity Plan. A high level of detail is included in the scheme about measures that should be taken to avoid the introduction of disease, including segregation of animals, testing, treatment etc., but this is not compulsory.

Five Step Lamb

Five Step Lamb requires the creation of a Biosecurity Plan, as well as its ongoing implementation. There is no clear requirement for the plan to be updated whenever there are changes to farm practice or structure. The scheme does not require a known health status for animals brought onto the unit, but does require that other measures are taken to avoid the introduction of disease from outside sources, including stock, visitors and vehicles.

CVS

The CVS scheme does not specifically require a biosecurity programme, but does require that biosecurity is considered within a Veterinary Care Programme. The scheme does assess biosecurity practice, and also requires treatment information to be obtained from sellers regarding animals that are brought onto the farm.

Some controls are suggested around the transfer of disease from farm visitors and equipment, and on-farm hygiene is covered.

AWA Beef

AWA Beef requirements around a biosecurity programme are less obvious than for some of the other schemes, but the key requirements are in place, with biosecurity being managed within a wider Animal Health Plan. Updating of biosecurity practice is not discussed. The scheme does not require a known health status for animals brought onto the unit, but it does encourage the maintenance of a closed herd. Little detail is provided around control of other routes for disease introduction.

AWA Lamb

AWA lamb requirements around a biosecurity programme are less obvious than for some of the other schemes, but the key requirements are in place, with biosecurity being managed within a wider Animal Health Plan. Updating of biosecurity practice is not discussed. The scheme does not require a known health status for animals brought onto the unit, but it does encourage the maintenance of a closed flock. Little detail is provided around control of other routes for disease introduction.

Legislative requirements

There are very limited requirements in legislation in any of the countries within regard to biosecurity and the prevention of transmission of disease. It could be argued in all three countries that the legislation could be used to prosecute a manager whose gross negligence permitted the transfer of disease which caused a very substantial welfare problem. However, this is extremely rare, and the main aim of good biosecurity is the prevention of disease, loss of thrift and general underperformance as this is much more common at farm level.

England

The Codes of Practice within England do contain references to the importance of good biosecurity (disease prevention measures) and recommend a focus on it within the Veterinary Health Plan.

USA

The Animal Health Protection Act allows for the destruction or removal of an animal to stop the spread of livestock pest or disease. There are also a number of biosecurity practices based on the U.S. Department of Agriculture APHIS and Natural Resources Conservation Service procedures, but these are not legislative.

Canada Legislation

There are a number of biosecurity standards and principals developed by the Canadian Food Inspection Agency (CFIA) in collaboration with producer organisations, provincial/territorial governments, and academia. The standard includes health practices; the movement of animals, people vehicles, equipment, and tools; and education, planning and recording.

Livestock Transport

The Livestock Transport category has been included because it is a critical control point for the welfare of meat animals. Poor or difficult transport conditions can severely compromise the health and welfare of animals over a short period of time and can also reduce the quality of the meat which comes from the animals. As such this is an animal welfare, animal health and food quality indicator, and is therefore an important consideration within a farm assurance scheme.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Livestock Transport category:

A. Is there a maximum permitted journey time?
B. Is there a maximum permitted journey distance?
C. What assurance requirements are there for vehicles/companies which are permitted to transport animals?
D. Is there a requirement for assured transport throughout the lifetime of the animal?
E. What are the conditions in which animals can be transported?
F. Is water/feed available during transport?
G. Is there a maximum/minimum stocking density during transport depending on species?
H. Are there speed recommendations during transport?
I. Are drivers aware of good animal welfare principles and are they effectively trained or certified?
J. Is certification and documentation in place?

Figure 12. Percentage weighted scores for each question area for the Livestock Transport category

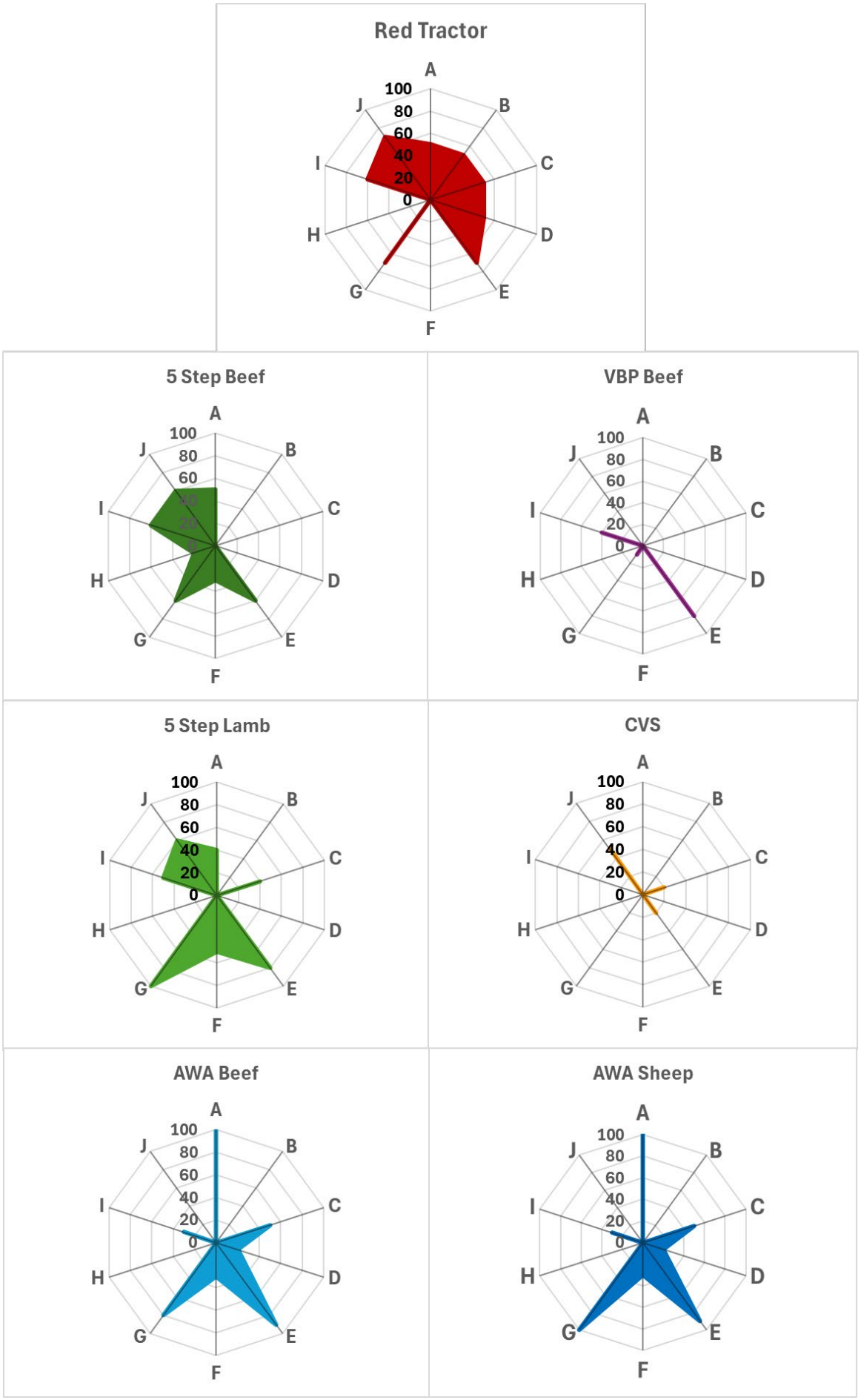


Table 16. Scores for the Livestock Transport category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	47/100	52
Five Step Beef	34/100	24
VBP	13/100	10
Five Step Lamb	42/100	31
CVS	9/100	7
AWA Beef	40/100	28
AWA Sheep	42/100	30

Summary of findings

The schemes show high variability in performance in this section. RT requires a reasonably strong level of control over transport of animals, requiring assured transport, good driver training and certification and appropriate handling of stock. The Five Step Beef and Lamb schemes allow long travel times and contain few requirements around transport conditions. AWA Beef and Lamb require relatively short travel times (eight hours), but do not contain many other requirements around transport. The CVS scheme contains very few requirements around transport of livestock.

Individual scheme findings

Red Tractor

The RT standard for transport places no limits on the distance animals can move, or maximum time limits for journeys, except for young lambs and calves which cannot be transported for more than 60km without their dam. Within England and the UK, distance and journey times are relatively limited for geographical reasons.

RT requires that assured transport is used, and this provides a degree of confidence around the conditions in which livestock can be transported. A farmer's own transport can be used for journeys of up to 65km and these vehicles are inspected during audit. Good driver training and certification is required and assured transport must be used. Some guidance is given around space allowances, but there do not appear to be strong guidelines around the mixing of different species or different classes of livestock.

Five Step Beef

The Five Step Beef standard requires that transport times do not exceed 16 hours, although no maximum journey distance is specified. Assured transport is not required. There are no clear guidelines for maximum or minimum stocking densities during transport. Some transport conditions are specified but are not comprehensive. The scheme contains some guidance around driver training, and there are clear requirements around transport documentation.

VBP

The VBP standard does not place distance or time limits on transport of livestock. There also no specifications around the need for assured transport. Transport conditions are specified and are relatively comprehensive, although stocking densities are not documented. Driver certification is not comprehensive.

Five Step Lamb

The Five Step Lamb standard requires that transport times do not exceed 16 hours, although no maximum journey distance is specified. Assured transport is not required. Minimum stocking densities during transport are provided and are appropriate. Other transport conditions are specified and are comprehensive. The scheme contains some guidance around driver knowledge and competency and there are clear requirements around transport documentation.

CVS

The CVS scheme does not specify maximum journey times or distances, and there are no requirements around use of assured transport. Some transport conditions are specified, but there are not comprehensive. The are no specifications around maximum or minimum stocking densities during transport. There is no guidance around driver knowledge or competency. Some documentation around transport is specified, but it is not comprehensive.

AWA Beef

AWA Beef limits transport of animals to eight hours maximum, although there is no maximum travel distance. There is no requirement for the use of assured transport, but there is a requirement that all transporters adhere to AWA standards. The scheme does require a detailed plan to ensure welfare of animals at transport. Appropriate minimum space allowances are specified. There are no specifications around transport documentation.

AWA Lamb

AWA Lamb limits transport of animals to eight hours maximum, although there is no maximum travel distance. There is no requirement for the use of assured transport, but there is a requirement that all transporters adhere to AWA standards. The scheme does require a detailed plan to ensure welfare of animals at transport. Appropriate minimum space allowances are specified. There are no specifications around transport documentation.

Legislative requirements

England

The transport of animals legislation in England is governed by Council Regulation (EC) No 1/2005 on the protection of animals during transport and related operations. This regulation requires that means of transport and containers used for transporting animals on long journeys (those in excess of eight hours) must be inspected and approved by the competent authority of a Member State or a body designated by a Member State. This is EU legislation that has currently been accepted for England and has not changed (although a consultation is ongoing). An analysis of the legislation shows that the RT standard makes requirements that are broadly the same as or just above English law, including guidance on distances, times, driver licensing etc.

The Welfare of Animals (Transport) Order 1997 (S.I. 1997 No. 1480) Article 6, states that: *(3) Animals shall not be considered fit for transport if (inter alia) they are newborn animals in which the navel has not completely healed. The Welfare of Animals at Markets Order 1990 (S.I. 1990 No. 2627), Article 14, states that: "no person shall bring to a market a calf which is less than seven days old or which has an unhealed navel", "no person shall bring to a market a calf which has been brought to a market on more than one occasion in the previous 28 days".*

A new ban on exporting live animals came into law on Monday 20 May as the Animal Welfare (Livestock Exports) Act received Royal Assent. The legislation bans the export of live animals (including cattle, sheep, and pigs) for slaughter and fattening from Great Britain.

USA

Livestock transport in the USA is governed by the 'Twenty-Eight Hour Law'. Enforced by the U.S. Department of Agriculture, it states that if livestock are being transported for longer than 28 consecutive hours, they must be offloaded for at least five consecutive hours to get feed, water, and rest.

Canada

In Canada, the federal government is responsible for regulating the humane transport of animals under Part XII – Transport of Animals of the Health of Regulations (HAR). These regulations define the conditions for humanely transporting all animals. The regulations establish requirements for the animal transport process

including, but not limited to, a requirement for the requisite knowledge and skills, contingency plans, assessment and monitoring of animals, maximum feed, water, and rest intervals, proper animal handling, care of vulnerable animals, animal outcomes, and transport records.

Vermin Control

The control of vermin is included because it is of particular importance where animals are housed. However, regardless of the housing or non-housing of animals, all schemes should include some guidelines around the control of vermin and pests that can potentially transmit disease.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in Vermin Control category;

A. Is a plan to control vermin required by the assurance scheme?
B. Are actions other than baiting required to prevent vermin infestation?
C. Is a site survey required on at least an annual basis?
D. Is an environmental risk assessment required prior to bait laying?
E. Are dead/trapped vermin disposed of regularly?
F. Are there requirements in place to ensure that non-target animals do not have access to baits?
G. Is permanent baiting prohibited?
H. Are product label directions followed during use?
I. Is a COSHH assessment required?

Figure 13. Percentage weighted scores for each question area in the Vermin Control category

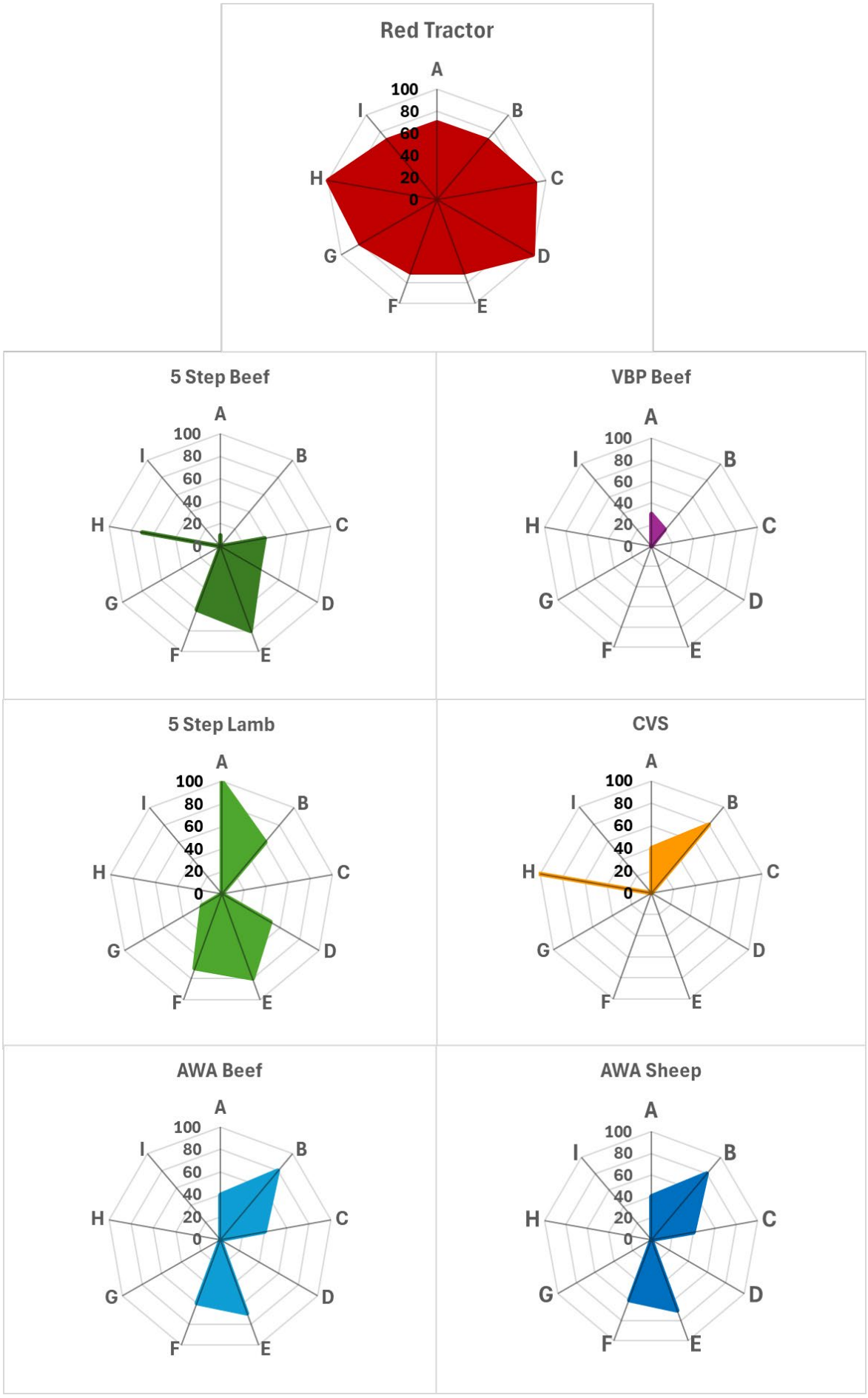


Table 17. Scores for the Vermin Control category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	72/90	81
Five Step Beef	30/90	44
VBP	5/90	6
Five Step Lamb	38/90	53
CVS	22/90	25
AWA Beef	29/90	40
AWA Sheep	29/90	40

Summary of findings

RT scores much higher than the other schemes in this section. It contains comprehensive requirements around the control of vermin and the use of poisoned baits. The scheme also requires a site survey and COSHH assessment prior to the use of bait. The level of detail in other schemes is much lower resulting from the absence of requirements for Vermin Control Plans and site surveys, as well as the absence of a requirement to utilise a COSHH assessment (or equivalent) prior to baiting.

Individual scheme findings

Red Tractor

RT scores higher across each of the assessment questions, with none of the scores below 70%. Specific detailed requirements are not included in the overall Vermin Control Plan- including justification for baiting; potential causes of vermin infestation; preventative measures to be taken as opposed to baiting or how to prevent poisoning of non-target species would also be helpful. Site surveys are only required every 12 months, which makes it more difficult to ensure that baiting occurs when needed. Bait must be removed when not needed for vermin control. RT requires a COSHH assessment prior to bait being used on the farm.

Five Step Beef

The Five Step Beef scheme does not include a requirement for a Vermin Control Plan. It does require some activity which will reduce pest infestation. No site survey is required, and no environmental risk assessment is specified. Live traps must be checked daily. There is no requirement around preventing access to bait by non-target animals. No COSHH or equivalent is required prior to use of baits.

VBP

The VBP scheme does not require a Vermin Control Plan. It does require some activity around minimising pests, but no site survey is required, and no environmental risk assessment is specified. There is no requirement to dispose of trapped vermin regularly. There is no requirement around preventing access to bait by non-target animals. No COSHH or equivalent is required prior to the use of baits.

Five Step Lamb

The Five Step Lamb scheme does not include a requirement for a Vermin Control Plan. It does require some activity to minimise pests. No site survey is required, and no environmental risk assessment is specified. Live traps must be checked daily. There is no requirement around preventing access to bait by non-target animals. No COSHH or equivalent is required prior to use of baits.

CVS

The CVS scheme does not specifically require a Vermin Control Plan, but does require that farm managers control or eliminate vermin. No site survey or environmental survey is required, there is no reference to the disposal of dead vermin, and there is no reference to prevention of access to bait by non-target animals. No COSHH or equivalent is required prior to use of baits.

AWA Beef

AWA Beef does not specifically require a Vermin Control Plan, but it is included as part of the overall health plan for the farm. It does require appropriate ongoing maintenance and housekeeping routines to minimise vermin infestation, and specifies detailed controls around the use of different control measures. Live traps must be checked twice daily. It requires that steps are taken to ensure that rodenticides cannot be accessed by non-target species.

AWA Lamb

AWA Lamb does not specifically require a Vermin Control Plan, but it is included as part of the overall health plan for the farm. It does require appropriate ongoing maintenance and housekeeping routines to minimise vermin infestation, and specifies detailed controls around the use of different control measures. Live traps must be checked twice daily. The scheme requires that steps are taken to ensure that rodenticides cannot be accessed by non-target species.

Legislative requirements

The management of vermin on the farm is not subject to specific legislative control in England, the USA or Canada. However the use of chemicals and poisons can fall under wider legislation which controls the following:

1) The type of poison which can be used
2) The chemical or poison's application and use
3) The controls around the chemical or poison

England

In England, the main legislation governing the use of vermin control chemicals is the Control of Pesticides Regulations (COPR). This legislation sets out rules for handling, storage and use of pesticides. The Wildlife and Countryside Act also contains guidance and controls around the use of poisons which could harm non-target species.

USA

In the USA the main law governing pesticide regulation is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The law requires manufacturers to register their products with the EPA, detailing the product's ingredients, effectiveness, safety and risks. However, each of the states can create their own legislation for use of products (or the products that can be used), meaning that requirements differ across the USA.

Canada

In Canada the main legislation which controls the use of poisons for vermin in Canada is the Pest Control Products Act (PCPA – S.C. 2002, c. 28). Under this act, products used to control vermin must be registered under the PCPA, which provides an overarching framework under which each of the provinces or territories may impose specific requirements or specific details about the use of poisons for vermin control.

Fallen Stock

Fallen Stock is included as a category because there is a risk to the environment, the health of other animals and potential spread of disease from stock which are not disposed of correctly. This is a generally a greater risk where farms are more intensive.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the category;

A. Does the scheme require regular checks for fallen stock?
B. Are carcass storage methods acceptable?
C. Are carcass disposal methods acceptable?
D. Are on-farm disposal facilities acceptable?

Figure 14. Percentage Weighted scores for each question area for the Fallen Stock category

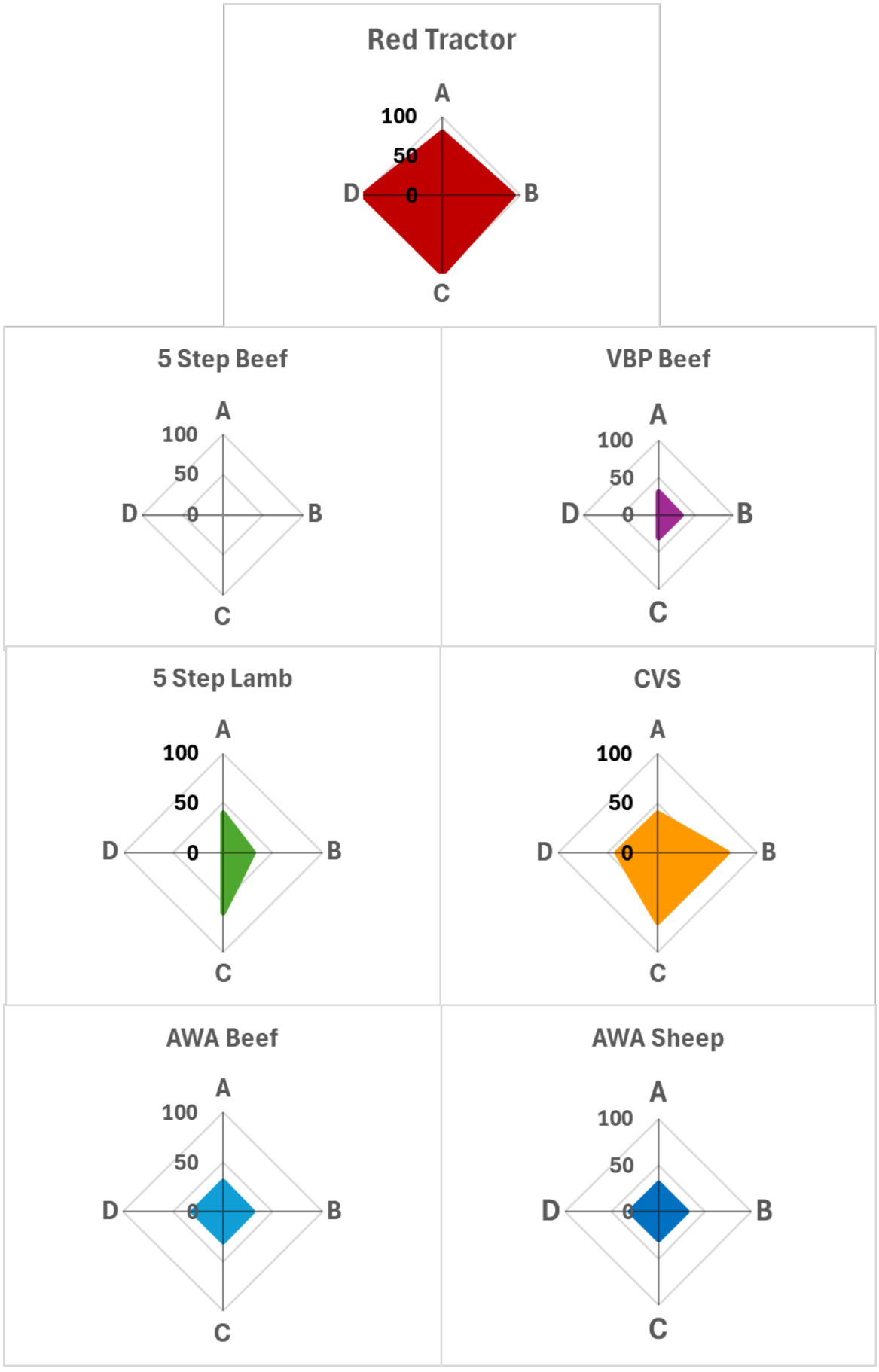


Table 18. Scores for the Fallen Stock category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	37/40	94
Five Step Beef	0/40	0
VBP	9/40	29
Five Step Lamb	13/40	37
CVS	22/40	72
AWA Beef	12/40	33
AWA Sheep	12/40	33

Summary of findings

RT scores highest in this section, with CVS being the only other scheme to score relatively highly. RT and CVS contain guidance around checking for fallen stock, and require appropriate actions around carcass disposal. The other schemes do not contain specific requirements for checking for fallen stock, and do not comprehensively address the methods of carcass disposal which may be used.

Red Tractor

RT contains a good level of detail around appropriate management of fallen stock. The scheme is highly specific in its requirements around inspection for fallen stock, collection, storage and disposal. Regular checks for fallen stock are required, carcass disposal takes place in a timely fashion, and that carcasses awaiting collection are stored appropriately. RT covers on-farm incineration.

Five Step Beef

Five Step Beef does not address the issue of fallen stock.

VBP

VBP does not specify the requirements for regular checking for fallen stock, but there is the expectation that fallen stock will be removed, and that disposal will take place in a manner which minimises contact with live animals and which avoids leaching into water bodies.

Five Step Lamb

The Five Step Lamb scheme does not require regular checks for fallen stock, although housed stock must be inspected daily. It does require that dead sheep must be immediately removed from housing and/or outdoor areas. Stock must be disposed of in a way which does not put other animals at risk.

CVS

The CVS scheme does not require regular checks for fallen stock, but requires regular inspection of livestock. The scheme has detailed requirements around the appropriate disposal of stock, and carcass storage prior to disposal. The scheme requires that local regulations are followed, and that contamination is avoided.

AWA Beef

The AWA Beef scheme does not require regular checks for fallen stock, but does require that livestock are inspected at least once a day. The scheme does allow for derogations around this for extensively reared livestock. Carcass disposal methods are not discussed, but carcass composting is allowed (which needs to be well controlled to prevent contamination). The scheme permits this compost to be reapplied to land.

AWA Lamb

The AWA lamb scheme does not require regular checks for fallen stock, but does require that sheep are inspected at least once per day. The scheme does allow for derogations around this for extensively reared livestock. Carcass disposal methods are not discussed, but carcass composting is allowed (which needs to be well controlled to prevent contamination). The scheme permits this compost to be reapplied to land.

Legislative requirements

England

The Animal By-Products (Enforcement) (England) Regulations 2013 control the disposal of carcases. Within the Red Tractor scheme the standards are broadly equivalent to the English legislative standard, although the scheme expands slightly on the regulations, covering regular inspection for stock and storage whilst awaiting disposal. The English standards require that fallen livestock must be disposed of appropriately and cannot be buried or burnt in the open because of the risk of disease spread through groundwater or air pollution.

USA

There is no federal legislation in the USA for the disposal of animal carcases.

Canada

There is no federal legislation in Canada for the disposal of animal carcases, which is instead covered under provincial legislation.

Environmental Protection

The Environmental Protection category is included because of its importance to the protection and maintenance of the environment in which the farm operates. This section is not about the creation and promotion of additional biodiversity or delivering reduction in GHG output, it is simply focused on the prevention of damage through correct management of risk areas on a farm, such as the storage and use of fertilisers or pesticides.

Questions against which the category was assessed

The following questions were used to assess the performance of each scheme in the Environmental Protection category:

A. Are pesticides stored correctly?
B. Are pesticides applied correctly?
C. Are pesticides disposed of correctly?
D. Are fertilisers stored correctly?
E. Are fertilisers applied correctly?
F. Are slurries and manures stored correctly?
G. Are slurries and manures applied correctly?
H. Are other potential contaminants dealt with appropriately?

Figure 15. Percentage weighted scores for each question area for the Environmental Protection category

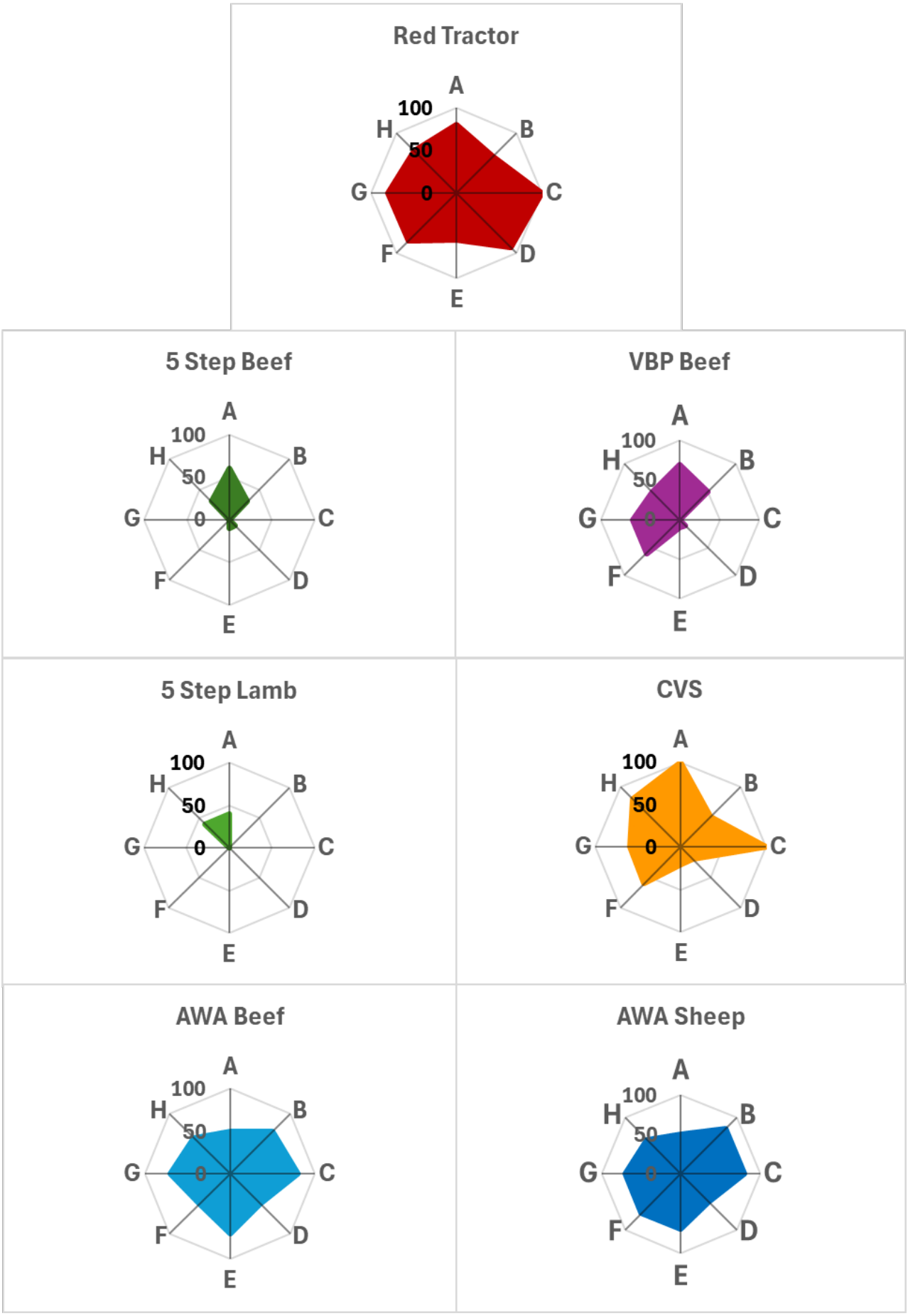


Table 19 Scores for the Environmental Protection category in each scheme

Scheme	Raw Score	Fully Weighted Percentage Score
Red Tractor	61.5/80	77
Five Step Beef	14/80	18
VBP	31/80	40
Five Step Lamb	8/80	11
CVS	49/80	63
AWA Beef	50/80	63
AWA Sheep	53/80	67

Summary of findings

A number of the schemes in this study score reasonably highly for Environmental Protection. RT obtains the highest weighted score, primarily because it comprehensively covers the main risk areas (with the exception of pre-application testing). CVS, and both of the AWA schemes also contain a good range of control measures, and AWA does not permit slurry to be created or used on-farm, only permitting manures, and while this is probably unworkable for many English farms, it does slightly reduce environmental risk due to the fact that the use of solid manures slows the speed of run-off (as opposed to slurries), allowing more time for absorption and reducing risk to watercourses. The VBP scheme contains fewer requirements again around the use of on farm chemicals and fertilisers. Neither of the Five Step schemes contain many requirements around the prevention of environmental pollution which reflects the fact that they are primarily focused on managing animal welfare.

Individual scheme findings

Red Tractor

RT contains good standards around appropriate storage, handling and application of pesticides and fertilisers but does not recommend methods of optimising application to maximise resource use efficiency and reduce the chances of environmental damage by the overapplication of chemicals. The scheme does not require appropriate testing/diagnosis prior to application.

Five Step Beef

Five Step Beef requires that animals are protected from contact with any potentially toxic substances, and that potentially toxic materials are stored correctly. There is no guidance around what constitutes good storage or appropriate application. The scheme contains no guidance around pesticide disposal. The scheme also does not cover storage or application of fertilisers, manures or slurries.

VBP

VBP requires that herbicides, pesticides and solvents are stored to avoid contamination of cattle feed or water. The scheme also requires that cattle operations manage risks to soil, aim or water. Fertilisers are not specifically discussed, but controls are required around the responsible use of manures.

Five Step Lamb

Five Step Lamb requires that animals are protected from contact with any potentially toxic substances. The scheme contains no guidance around pesticide application or disposal. The scheme also does not cover storage or application of fertilisers, or of manures or slurries.

CVS

The CVS scheme contains very specific detail around the storage of chemicals, pesticides, fuels and other contaminants. All local legislation must be followed. Nutrient management is considered within the scheme, but a nutrient management plan is not specifically required.

AWA Beef

The AWA Beef scheme does not specifically discuss storage of pesticides, but there are clear requirements in the scheme around the prevention of environmental pollution. Pesticide application and disposal are specified, but the storage and application of fertilisers is not. Slurries are not permitted, and the scheme contains some requirements around the application of manures.

AWA Lamb

The AWA Lamb scheme does not specifically discuss storage of pesticides, but there are clear requirements in the scheme around the prevention of environmental pollution. Pesticide application and disposal are specified, but the storage and application of fertilisers is not. Slurries are not permitted, and the scheme contains some requirements around the application of manures.

Legislative requirements

The control and use of pesticides is heavily regulated in each country in this study, and the requirements within the farm assurance schemes are primarily based on the relevant legislation.

England

Within England, pesticide use is controlled by the Health and Safety Executive. Users of pesticides are required to comply with the official controls, and pesticide products must be authorised for use before they can be used, sold, supplied or stored. The requirements set out the competence requirements for sale and use of Plant Protection Products (PPPs), the use, handling and storage requirements of PPPs (including aerial spraying) and requirements for the inspection of PPP equipment. Everyone who uses a PPP must, amongst other things: take all reasonable precautions to protect human health and the environment; confine the application of the pesticide to the crops or area to be treated; ensure when using pesticides in certain specified areas, for example, those used by the general public, that the amount of PPP used and the frequency of use are as low as are reasonably practicable. Anyone using a professional PPP must either have a recognised specified certificate (previously known as a 'Certificate of Competence') or be working under the direct supervision, for the purposes of training, of someone who has such a certificate. The majority of the standards within RT are therefore legislative, with other details being taken from the Code of Practice. The Code of Practice are much more detailed than RT requirements.

In England, the main legislation governing the use of vermin control chemicals is the Control of Pesticides Regulations (COPR). This legislation sets out rules for handling, storage and use of pesticides. The Wildlife and Countryside Act also contains guidance and controls around the use of poisons which could harm non-target species.

USA

The Environmental Protection Agency oversees environmental protection in the US. It has a comprehensive list of legislation. In terms of Livestock, Poultry and Aquaculture (including beef, dairy, swine, poultry, aquaculture) the National Pollutant Discharge Elimination System (NPDES) must approve permits if concentrated Animal Feeding Operations are being discharged info United States waters.

For chemical handling of hazardous products, particularly on a farm handling a high threshold of extremely hazardous chemicals, the Emergency Planning & Community Right to Know Act (EPCRA) must be adhered to.

In the USA the main law governing pesticide regulation is the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The law requires manufacturers to register their products with the EPA, detailing the product's ingredients, effectiveness, safety and risks. However, each of the states can create their own legislation for use of products (or the products that can be used), meaning that requirements differ across the USA. There are also other acts which control application levels and usage. The Federal Food, Drug, and Cosmetic Act (FFDCA) sets limits on the amount of pesticide residues allowed on food or animal feed, whiles the Food Quality

Protection Act (FQPA) requires that it is understood that a pesticide has a reasonable certainty of causing no harm before it can be registered for use on food or feed.

Canada

The Canadian Government have recently taken a number of federal actions to aid environmental protection, such as the upcoming Sustainable Agriculture Strategy. The Sustainable Agriculture Strategy focuses on the environmental pillar of sustainability of Canada's food system, within the broader context of social and economic challenges and opportunities in the sector. It will address the sustainability of productive agriculture, including the interlinked environmental benefits of farming and promoting the benefits of sustainable agriculture.

In Canada the main legislation which controls the use of pesticides in Canada is the Pest Control Products Act (PCPA – S.C. 2002, c. 28). It is administered under Health Canada's Pest Management Regulatory Agency (PMRA). Under this act, pest control products must be registered under the PCPA, which provides an overarching framework under which each of the provinces or territories may impose specific requirements or specific details about the use of poisons for vermin control.

Summary of findings

The findings from this study show that, when directly compared, RT achieves a higher average score than the other schemes. However, there are four areas where other schemes display higher performance than RT

- Feed and Water: Five Step Lamb scored higher than RT in this category, with Five Step Beef equalling RT
- Husbandry Procedures: Five Step Lamb scored higher than RT in this category
- Youngstock Management: AWA scored higher than RT in this category, with AWA Beef and CVS also higher than RT
- Animal Health and Welfare: CVS scored higher than RT in this category

There is also one category where another scheme performs as well as RT

- Biosecurity and Disease Control: CVS and RT are the highest scoring schemes in this category.

In general, RT is more prescriptive and contains more detail than the other schemes, and therefore scores more highly in any overall comparison because it targets areas which are important to the English consumer. The following table shows how each scheme compares in each category using the fully weighted percentage scores.

Table 20. Final weighted percentage scores for all schemes[9]

Category	RT	Five Step Beef	VBP Beef	Five Step Lamb	CVS	AWA Beef	AWA Lamb
Traceability, Documentation and Assurance	77%	30%	22%	24%	25%	36%	37%
Personnel	72%	34%	48%	37%	67%	16%	16%
Food Safety	77%	61%	69%	46%	59%	41%	44%
Housing and Shelter	75%	52%	48%	42%	70%	64%	64%
Feed and Water	85%	85%	63%	87%	82%	74%	74%
Husbandry Procedures	74%	52%	52%	82%	71%	59%	66%
Youngstock Management	81%	80%	68%	79%	87%	93%	94%
Animal Health and Welfare	59%	43%	38%	50%	61%	53%	54%
Animal Medicines	77%	23%	66%	39%	62%	41%	41%
Biosecurity and Disease Control	67%	59%	37%	66%	67%	37%	34%
Livestock Transport	52%	24%	10%	31%	7%	28%	30%
Vermin Control	81%	44%	6%	53%	25%	40%	40%
Fallen Stock	94%	0%	29%	37%	72%	33%	33%
Environmental Protection	77%	18%	40%	11%	63%	63%	67%

[9] Highlighted green cells indicated scheme which as received the highest weighted percentage score

Summary of categories

Traceability, Documentation and Assurance

An effective farm assurance scheme must inspect and record against a clearly defined set of standards and must, to a high degree of confidence, be able to assure that the livestock products which are eventually sold can be traced back to the farm from which they originated. To this end, the basic scheme standards should be robust, and the documentation created by the scheme detailed and specific enough to allow the user to be confident that the scheme delivers against its stated aims.

RT receives higher scores than all the other schemes within the Traceability, Documentation and Assurance Section. The other schemes in have very similar scores in this section, but all score less than half that of Red Tractor. This is primarily a function of the more detailed cattle and sheep identification requirements in England (and inspection against this), the detailed record keeping requirements within RT, the regular audit frequency and the fact that the scheme is ISO17065 accredited. None of the other schemes combine all of these features and consequently score lower than Red Tractor.

Personnel

The personnel category has been designed to test the assurance which the schemes provide around the welfare of those who access and work on farms. This concept includes the safety of staff as they work on the farm, the induction and training that is required, the qualifications which are necessary for a person to work on the unit, the ways in which competency and training needs are assessed, and the continuous professional development that takes place on the farm.

RT and CVS score highest within the Personnel category. This is primarily because these schemes place a focus on personnel and contain additional requirements over those in the other schemes. Both RT and CVS contain relatively detailed requirements around staff competency, observation at work on a regular basis, and the provision of training. The VBP scheme requires some training, as do both Five Step schemes, but the level of detail provided is not high. The AWA schemes do not focus on training. Only RT addresses worker health and safety in any detail.

Food safety

The Food Safety section was designed to test the effectiveness of each assurance scheme in ensuring that food sourced from livestock produced under their schemes are free from contamination by chemicals, tainted food, or physical contaminants such as broken needles.

Within this group of assurance schemes, RT performs highest in terms of food safety, containing strong requirements around control of vermin, safe storage of feed and chemicals, and having robust traceability. VBP also contains strong requirements around food safety and uses a HACCP approach. However, the extended audit intervals in this scheme impact its robustness. CVS and Five Step Beef require good record keeping, but only Five Step has frequent farm audits (every 15 months). The other schemes contain fewer specific requirements and consequently score lower.

Housing and Shelter

The Housing and Shelter section was designed to ensure that animals produced under each assurance scheme have accommodation which is appropriate to their needs. This includes housing and the provision of appropriate shelter when animals are outside.

RT and CVS scored more highly than the other schemes in this section, and the two AWA schemes scored relatively highly as well. All of these schemes contain detailed requirements about housing and the conditions in which animals can be kept. The Five Step schemes do not score as well in this section because they are

broadly focused on pastoral systems and do not contain high levels of detail around housing. The VBP scheme also contains fewer requirements and standards around housing that the schemes which score more highly.

Feed and Water

The Feed and Water category questions were designed to test if the assurance scheme can ensure that cattle and sheep have ready access to appropriate, clean, fresh feed and water, and that the nutritional needs of the animal are fully met.

With the exception of VBP, all schemes score highly in this section covering the provision of clean, fresh and palatable food and water in detail and emphasising its importance. VBP contained fewer recommendations and guidance around appropriate feeding and as a consequence, its score fell below the others.

Husbandry Procedures

The Husbandry Procedures section was designed to identify what procedures are permitted under each scheme, the ages at which specific practices are permitted and the measures which are taken to protect animal welfare during the procedures.

Five Step Lamb scored highest in the husbandry section, mainly because it places tight controls around permissible procedures and the conditions under which these procedures can be delivered, and because it requires training for those who deliver the procedures. Red Tractor also scores relatively highly, alongside CVS, with both schemes containing clear requirements which control the delivery of husbandry procedures. The other schemes generally permit husbandry procedures to a higher age, or contain fewer restrictions than the schemes which score highest.

Youngstock Management

Youngstock Management was included due to its critical importance to the long-term health of the animal. The conditions under which animals are farmed do differ between the countries in this study, placing extra demands on housing design.

With the exception of VBP, all schemes score highly in this section, with each scheme containing specific requirements around the management of youngstock, that they receive appropriate nutrition, that accommodation is appropriate and that they have social contact with other animals. VBP falls below the other schemes by containing fewer requirements around nutrition of very young animals.

Animal Health and Welfare

The Animal Health and Welfare category was included within the assessment because, outside of food safety, this is the area which is of most importance to consumers[10].

The CVS scheme scores highest in relation to Animal Health and Welfare. Both CVS and RT schemes cover relatively wide levels of detail, requiring active Vet Health Plans and appropriately trained staff. CVS requires lameness monitoring and body condition scoring – both useful for maintaining the health of a flock. The AWA and VBP schemes score lower because they display an absence of focus on training of staff around the management of health and welfare.

[10] AHDB/Blue Marble, 2022

Animal Medicines

The Animal Medicines category was created to assess the scheme's ability to control the use of medicines, to ensure that they are used effectively and that they cannot enter the food chain.

RT scores highest in this category and contains strong requirements around the storage, control, use and recording of animal medicines. VBP and CVS also have relatively high levels of detail on the same topics, but the other schemes in this study contain fewer requirements as well as requiring lower levels of staff training. Many of the schemes do not contain requirements for a broken needle policy.

Biosecurity and Disease Control

There is a genuine importance to preventing spread of disease through optimised biosecurity. This has traditionally been an area where beef and sheep farms have underperformed[11] in comparison to other sectors such as pig and poultry, with many fewer restrictions about who can enter a farm and have contact with animals, the ability to take animals to market and bring them back, and the lack of isolation of newly purchased animals from other animals already on the farm.

There is strong variability in how the schemes perform in this area. RT, Five Step Beef, Five Step Lamb and CVS all require the creation of an active Biosecurity Plan, and that it is kept up to date. Other concepts such as hygiene and isolation procedures are covered by these schemes, but none require a known health status for animals being brought onto the farm. The other schemes score lower, and do not specifically require Biosecurity Plans and do not contain high levels of detail around control procedures to prevent transmission of disease onto each unit.

Livestock Transport

The Livestock Transport category was included because it is a critical control point for the welfare of meat animals. Poor or difficult transport conditions can severely compromise the health and welfare of animals over a short period of time and can also reduce the quality of the meat from the animals[12]. As such, this is an animal welfare, animal health and food quality indicator and is therefore an important consideration within a farm assurance scheme.

The schemes show high variability in performance in this section. RT requires a reasonably strong level of control over transport of animals, requiring assured transport, good driver training and certification and appropriate handling of stock. The Five Step Beef and Lamb schemes allow long travel times and contain few requirements around transport conditions. AWA Beef and Lamb require relatively short travel times (eight hours), but do not contain many other requirements around transport. The CVS scheme contains very few requirements around transport of livestock.

Vermin Control

The control of vermin was included because it is of particular importance in regions where animals are regularly housed. RT scores much higher than the other schemes in this section. RT contains comprehensive requirements around the control of vermin and the use of poisoned baits. The scheme also requires a site survey and COSHH assessment prior to the use of bait. The level of detail in other schemes is much lower, resulting from the absence of requirements for Vermin Control Plans and site surveys, as well as the absence of a requirement to utilise a COSHH assessment (or equivalent) prior to baiting.

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[11] Cennydd Owen Jones et al, *'Biosecurity in UK Livestock Farms: An Insight Into current Practice'* Jan '23

[12] Gary C. Smith et al *'Effect of Transport on Meat Quality and Animal Welfare of Cattle, Pigs, Sheep, Horses, Deer, and Poultry'* December 2004

Fallen Stock

Fallen Stock was included as a category because of the risk to the environment, the health of other animals and the potential spread of disease from stock which are not disposed of correctly.

RT performs highest in this section, with CVS being the only other scheme to score relatively highly. RT and CVS contain guidance around checking for fallen stock, and require appropriate actions around carcass disposal. The other schemes do not contain specific requirements for checking for fallen stock, and do not comprehensively address the methods of carcass disposal which may be used.

Environmental Protection

The Environmental Protection category was included because of its importance to the protection and maintenance of the environment in which the farm operates. This section is not about the creation and promotion of additional biodiversity or delivering reduction in GHG output, it is simply focused on the prevention of damage.

A number of the schemes in this study score reasonably highly for Environmental Protection. RT obtains the highest score, primarily because it comprehensively covers the main risk areas (with the exception of pre-application testing). CVS, and both of the AWA schemes also contain a good range of control measures, and AWA does not permit slurry to be created or used on-farm, only permitting manures. Whilst this is probably unworkable for many English farms, it does reduce environmental risk. The VBP scheme contains fewer requirements again around the use of on farm chemicals and fertilisers. The Five Step Beef or Lamb schemes contain very few requirements around the prevention of environmental pollution which reflects the fact that they are primarily focused on managing animal welfare.

Summary of legislation

The legislative framework in each country was researched as part of this project. This was not a forensic analysis, but was designed to uncover the broad base legislation against which farms operate and which will inevitably form some of the requirements within assurance schemes. Legislation is useful, but by itself is rarely inspected. Farm assurance schemes provide a degree of assurance around adherence to legislation because this forms part of the inspection process. The basic legislation under each inspection category was summarised as follows:

Traceability, Documentation and Assurance

A significant component of the content of all three schemes is based on legislation in the countries in which they are based. In England, practice is based on a number of regulations governing traceability of livestock. These include Cattle Identification Regulations 2015 (CIR), EC Hygiene Regulations and the SAGRIMO Order enforcing the Council Regulation (EC) 21/2004. Under these regulations, powers are given to the competent authorities and specify requirements for keepers with respect to notification of holdings, ear tags, registration of cattle, cattle passports, notification of movements or death, and record keeping. The key requirement for traceability is the requirement to tag individual animals.

In the USA, traceability regulations are designed to improve the ability of animal health officials to trace livestock when disease is found. In Canada, traceability is covered by the livestock identification programme (TRACE).

Personnel

Within each region, there is extensive legislation which governs employment and wellbeing of personnel at work. This legislation is not usually specific to agriculture. The relevant legislation is normally framed as employment law and covers employment contracts and health and safety at work. The regulations only cover appropriate induction and training from a human safety perspective, they do not cover competency for the tasks they are required to deliver, with the exception of the use of potentially dangerous chemicals.

In England the Management of Health and Safety at Work Regulations 1999 require that all employers or the self-employed assess their own risk, and the risk to anyone working for them regarding their working environment. The Health and Safety Executive has issued guidance which can be used to assure compliance.

In the USA, the Occupational Safey and Health Act is aimed at ensuring that employees work in a safe and healthful environment by setting and enforcing standards, and by providing training, outreach, education, and assistance. Employers must comply with all applicable OSHA standards. Employers must also comply with the General Duty Clause of the OSH act, which requires that the workplace is kept free of serious recognized hazards.

In Canada, Health and Safety of people at work is covered by provincial legislation and can differ across Canada. There is, however, a Canada Labor Code which covers the responsibilities both employers and employees at work.

Food safety

Food safety is of critical importance within each region, and all three areas carry extensive legislation to govern activities and practice. The primary factors relating to food safety in farming are related to cleanliness of animals at slaughter, avoidance of contamination with medicines or chemicals, and the ability to trace animal movements throughout the food chain should a challenge occur. As a result, specific food safety legislation does not tend to apply to farms in these regions in the same way that the requirements around safe pesticide storage and use, or the specific rules around reporting of animal movements.

For each region in this study, there is relatively little information on the control of food safety at farm level in any of the food safety legislation, as this is primarily focused on fresh food at the consumption ready stage. The main legislation which is applicable at farm level in each country is that which controls medicine usage and chemical/pesticide usage, and is aimed at avoiding contamination of meat with medicines or other chemicals.

Within England, food safety is governed by the Food Standards Agency, established by the Food Safety Act 1990 which also provides the framework for all food legislation in England, Wales and Scotland. Traceability is governed by Article 18 of Regulation (EC) No. 1978/2002 and establishes the need and requirements for traceability at all stages of production, processing and distribution.

Food safety in the USA is governed by the Food Safety Modernization Act (FSMA) 2011. The act is governed by the Food and Drug Administration (FDA), which has jurisdiction over domestic and imported foods that are marketed in interstate commerce, except for meat and poultry products. FDA's Center for Food Safety and Applied Nutrition (CFSAN) seeks to ensure that these foods are safe, sanitary, nutritious, wholesome, and honestly and adequately labelled.

The main federal legislation in Canada covering food safety is the Food and Drugs Act. This Act prohibits the manufacture or sale of all dangerous or adulterated food products anywhere in Canada. There are other pieces of legislation which may reference this Act but may stipulate additional requirements such as the *Canada Agricultural Products Act, Meat Inspection Act, Fish Inspection Act, Seeds Act, Fertilizer Act* and *Feeds Act*. Also contributing to the regulatory framework is the *Pest Control Products Act.* As it is understood that animal diseases have the potential to impact the safety of food and products originating from farm animals, the *Health of Animals Act*, administered by the Canadian Food Inspection Agency (CFIA), is also an important piece of legislation to provide further assurance of the safety of the food supply.

Housing and Shelter

There is limited specific legislation around housing and shelter of animals in any of the regions in this study, with principles for governance being drawn instead from animal welfare requirements. Within England, housing is covered by legislation but also governed by the broader animal welfare regulation. Farming activity within England is also based on Codes of Good Agricultural Practice.

Within England, the Welfare of Farmed Animals (England) Regulations 2000 (S.I. 2000 No. 1870) requires that any person who employs or engages a person to attend to animals shall ensure that the person attending to the animals: is acquainted with the provisions of all relevant statutory welfare codes relating to the animals being attended to; has access to a copy of those codes while he is attending to the animals; and has received instruction and guidance on those codes. The legislation states that “any person who keeps animals, or who causes or knowingly permits animals to be kept, shall not attend to them unless he has access to all relevant statutory welfare codes relating to the animals while he is attending to them, and is acquainted with the provisions of those codes”. Consequently, animal housing in England must be appropriate and must not cause discomfort or pain. However, the legislation is non-specific and each incident would be treated on a case by case basis.

Most policy about the housing and treatment of farm animals in USA is administered by states themselves. Farm animals are not covered by the Animal Welfare Act (AWA), although there are some exceptions. Nine states have outlawed gestation crates, while some others also required that products sold within their state boundaries be from animals raised in the same living conditions as those required by in-state producers.

Likewise, Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals but there are no federal laws protecting animals on farms except in limited cases of cruelty (Canada’s Criminal Code).

Feed and Water

Legislation in all regions requires that animals receive enough water and access to a diet in sufficient amounts to meet all nutritional needs of the animal enabling it to remain in good health. Codes of Practice or Guidance are available in most regions to enable the farmer to understand their responsibilities. As for many of the other categories, the feeding of animals falls under general animal welfare legislation, and also the interpretation of the farm manager and those who enforce the legislation.

In England, the legislation governing the provision of food and water is the Animal Welfare Act 2006. It requires that animals must have a suitable diet (which includes access to water). The Code of Practice for cattle and sheep cover what constitutes a suitable diet in extensive detail. The majority of the RT standard in this case is therefore essentially a less detailed repeat of the Cattle and Sheep Code of Practice. Feed storage *per se* is not generally covered in the legislation, but falls under the concept of clean, fresh and appropriate food. Hormone Growth Promoters are not permitted.

In the USA, most policy about the treatment of farm animals is administered by states. Farm animals are not covered by the Animal Welfare Act (AWA), and in most cases do not have federal legal protections until they are transported off the farm.

Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals but there are no federal laws protecting animals on farms except in limited cases of cruelty (Canada's Criminal Code). Livestock feeds are regulated under the Feeds Act and Regulations, which are administrated by the Canadian Food Inspection Agency, whose role is to verify that livestock feeds manufactured and sold in Canada or imported are safe, effective and labelled appropriately.

Husbandry Procedures

Animal welfare regulations govern the husbandry procedures which are permitted in each country, and the scheme standards are broadly equivalent to legislative standards in the relevant region including requirements around use of anaesthetics or analgesics when performing specific painful husbandry practices.

In England, husbandry procedures are mainly covered under The Welfare of Farmed Animals (England) Regulations 2007, and the Animal Welfare Act 2006 which set the minimum welfare standards for all farm animals. These cover standards for stockmanship; health, feed, water and other substances; accommodation; equipment; management; fire and other emergency precautions; pregnancy, rearing, and breeding.

Under The Protection of Animals (Anaesthetics) Act 1954, as amended, it is an offence to disbud calves or dehorn any cattle without the use of an anaesthetic other than when chemical cauterisation is used. In England, the use of a rubber ring, or other device, to restrict the flow of blood to the scrotum, is only permitted without an anaesthetic if the device is applied during the first week of life. The Protection of Animals (Anaesthetics) Act 1954 makes it an offence to remove a supernumerary teat from a calf which has reached three months of age without the use of an anaesthetic.

Most legislation within the USA regarding husbandry procedures is covered under state, and not federal legislation. In 37 states the most common practices such as tail docking and castration without anaesthesia are exempt from the definition of cruelty, unless specifically prohibited in the state. There is also little or no legislation governing the use of antibiotics in the USA, although due to consumer interest the Food and Drug Administration (FDA) has issued guidance implementing voluntary plans to phase out the use of medically important antibiotics in livestock for production purposes.

There is no federal legislation that addresses the welfare of animals on the farm. The National Farm Animal Care Council (NFACC) produces Code of Practice for the care and handling of farm animals, which detail non-regulatory requirements and recommendations for good animal care on farms. Canadian Council on Animal Care (CCAC) guidelines in terms of husbandry state that: Cattle housed indoors should be checked at least

twice daily for injuries, especially to the legs and neck. The reasons for these injuries should be investigated and corrected.

Youngstock Management

There is a very limited amount of legislation within any of the regions in the study which is relevant specifically to youngstock. The legislation which controls the welfare of and husbandry procedures on youngstock is contained within the general animal welfare legislation of each country.

In general, legislation in each jurisdiction considers the welfare of all animals, rather than that of youngstock specifically, and therefore provisions within farm assurance schemes help ensure that the proper care and attention is given to this specific category.

Within England, the legislation does not differentiate youngstock from mature stock in most incidences. The Code of Practice for the management of cattle and sheep do describe the required nutrition for younger stock and the necessity of them receiving adequate levels of colostrum inside the first few hours of birth and appropriate ongoing nutrition.

Within the USA and Canada, there is no separate legislation for youngstock.

Animal health and welfare

Animal health and welfare is covered within each region by animal welfare legislation. Good animal health and welfare is an output of a wide range of factors, including management practices, housing, nutrition and husbandry procedures, as well as effective health and welfare planning. Legislation in all regions does not require the presence of a Veterinary Health Plan.

In England, under The Protection of Animals (Anaesthetics) Act 1954, as amended, it is an offence to disbud calves or dehorn any cattle without the use of an anaesthetic other than when chemical cauterisation is used. The Welfare of Farmed Animals (England) Regulations 2007 set the minimum welfare standards for all farm animals. It covers standards for stockmanship; health; feed, water and other substances; accommodation; equipment; management; fire and other emergency precautions; pregnancy; rearing; and breeding.

There are no federal animal welfare laws in the USA regulating the treatment of livestock while they're on the farm. The animal welfare act regulates the treatment of animals in research, teaching, testing, exhibition, transport, and by dealers. However, it excludes the protection of farm animals.

Canadian provinces have the primary responsibility for protecting the welfare of animals, including farm animals and companion animals. All provinces and territories have laws to ensure animal welfare, and the Criminal Code of Canada prohibits anyone from wilfully causing animals to suffer from neglect, pain or injury.

Animal Medicines

In England, keeping accurate records of medicine use on farms is a legal requirement. The owner or keeper of food-producing animals must maintain records related to the purchase of all veterinary medicinal products acquired for those animals. These records should be kept for a minimum of five years. When administering medicine (either themselves, or administered by a vet), farmers must record: Name of the product, date of administration, quantity administered, withdrawal period, and identity of the treated animal(s).

Animal medicines in the USA are strictly regulated by the Food and Drug Administration, and must follow a rigorous approval process. One approved, they remain heavily regulated and are subject to strict laws. Additional inspections and reviews are carried out after approval including inspections of the manufacturing facilities and regulations are also applied to product labels and promotional materials to ensure accuracy. The

approvals process classifies the drug as prescription, over-the-counter, or veterinary feed directive which puts restrictions on how the drug can be obtained.

Veterinary drugs in Canada are regulated under the Food and Drugs act and regulations by Health Canada. To be approved, evidence must be provided to the Veterinary Drugs Directorate (part of Health Canada) to prove the drug is safe for the animals that will be treated, safe for humans (if used in food-processing animals), effective at treating the condition for which it is approved, and of high quality. Once approved, animal medicines are monitored to ensure their continued safety.

Biosecurity and Disease Control

There are very limited requirements in legislation in any of the countries within regard to biosecurity and the prevention of transmission of disease. The Codes of Practice within England do contain references to the importance of good biosecurity (disease prevention measures) and recommend a focus on it within the Veterinary Health Plan.

The Animal Health Protection Act in the USA allows for the destruction or removal of animal to stop the spread of livestock pest or disease. There are also a number of biosecurity practices based on the U.S. Department of Agriculture APHIS and Natural Resources Conservation Service procedures, but these are not legislative.

There are a number of biosecurity standards and principals developed by the Canadian Food Inspection Agency (CFIA) in collaboration with producer organisations, provincial/territorial governments, and academia. The standard includes health practices; the movement of animals, people vehicles, equipment, and tools; and education, planning and recording.

Livestock Transport

Livestock transport is the subject of legislation with each region in the study.

In England, the transport of animals legislation in England is governed by Council Regulation (EC) No 1/2005 on the protection of animals during transport and related operations. This regulation requires that means of transport and containers used for transporting animals on long journeys (those in excess of eight hours) must be inspected and approved by the competent authority of a Member State or a body designated by a Member State. This is EU legislation but has currently been accepted for England and has not changed (although a consultation is ongoing). An analysis of the legislation shows that the RT standard makes requirements that are broadly the same as or just above English law, including guidance on distances, times, and driver licensing.

Livestock transport in the USA is governed by the 'Twenty-Eight Hour Law'. Enforced by the U.S. Department of Agriculture, it states that if livestock are being transported for longer than 28 consecutive hours, they must be offloaded for at least five consecutive hours to get feed, water, and rest.

In Canada, the federal government is responsible for regulating the humane transport of animals under Part XII – Transport of Animals of the Health of Regulations (HAR). These regulations define the conditions for humanely transporting all animals. The regulations establish requirements for the animal transport process including, but not limited to, a requirement for the requisite knowledge and skills, contingency plans, assessment and monitoring of animals, maximum feed, water, and rest intervals, proper animal handling, care of vulnerable animals, animal outcomes, and transport records.

Vermin Control

The management of vermin on the farm is not subject to legislative control in England, the USA, or Canada but the use of chemicals and poisons can fall under specific legislation which controls the following:

1) The type of poison which can be used

2) Its application and use
3) The controls around it

None of the requirements around vermin control (other than safe, appropriate use) are legislative within this category.

Fallen Stock

The Animal By-Products (Enforcement) (England) Regulations 2013 control the disposal of carcases. English standards require that fallen livestock must be disposed of appropriately and cannot be buried or burnt in the open because of the risk of disease spread through groundwater or air pollution. In England, the Animal By-Products (Enforcement) (England) Regulations 2013 control the disposal of carcases. Within RT the standards are broadly equivalent to the English legislative standard, although the scheme expands slightly on the regulations, covering regular inspection for stock and storage whilst awaiting disposal. The English standards require that fallen livestock must be disposed of appropriately and cannot be buried or burnt in the open because of the risk of disease spread through groundwater or air pollution.

There is no federal legislation covering fallen livestock in either the USA or Canada.

Environmental Protection

The concept of environmental protection is contained within the legislation of each country. The legislation which governs this is mainly contained within other legislation, such as that governing the use of pesticides, fertilisers or manures. Within England, pesticide use is controlled by the Health and Safety Executive. Users of pesticides are required to comply with the Official Controls, and before any pesticide product can be used, sold, supplied or stored it must be authorised for use. The requirements set out the competence requirements for sale and use of PPPs, the use, handling and storage requirements of PPPs (including aerial spraying) and requirements for the inspection of PPP equipment. Anyone using a professional PPP must either have a recognised specified certificate (previously known as a 'Certificate of Competence') or be working under the direct supervision, for the purposes of training, of someone who has such a certificate. The majority of the standards within RT are therefore legislative, with other details being taken from the Code of Practice. The Code of Practice are much more detailed than RT requirements.

The Environmental Protection Agency oversees environmental protection in USA. It has a comprehensive list of legislation. In terms of livestock, poultry and aquaculture (including beef, dairy, swine, poultry, aquaculture) the National Pollutant Discharge Elimination System (NPDES) must approve permits if concentrated Animal Feeding Operations discharge to a water of the U.S. Legislation of pesticides is covered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), with air pollution covered under the Clean Air Act. For chemical handling of hazardous products, particularly on a farm handling a high threshold of extremely hazardous chemicals the Emergency Planning & Community Right to Know Act (EPCRA) must be adhered to.

The Canadian Environmental Protection Act is the national legislation for environmental protection in Canada, and covers an extensive list of areas of the environment. Its fundamental purpose is to protect human health and ecosystem health from the adverse effects of toxic substances and pollution.

Conclusions

Figure 16. Final weighted percentage scores for each scheme

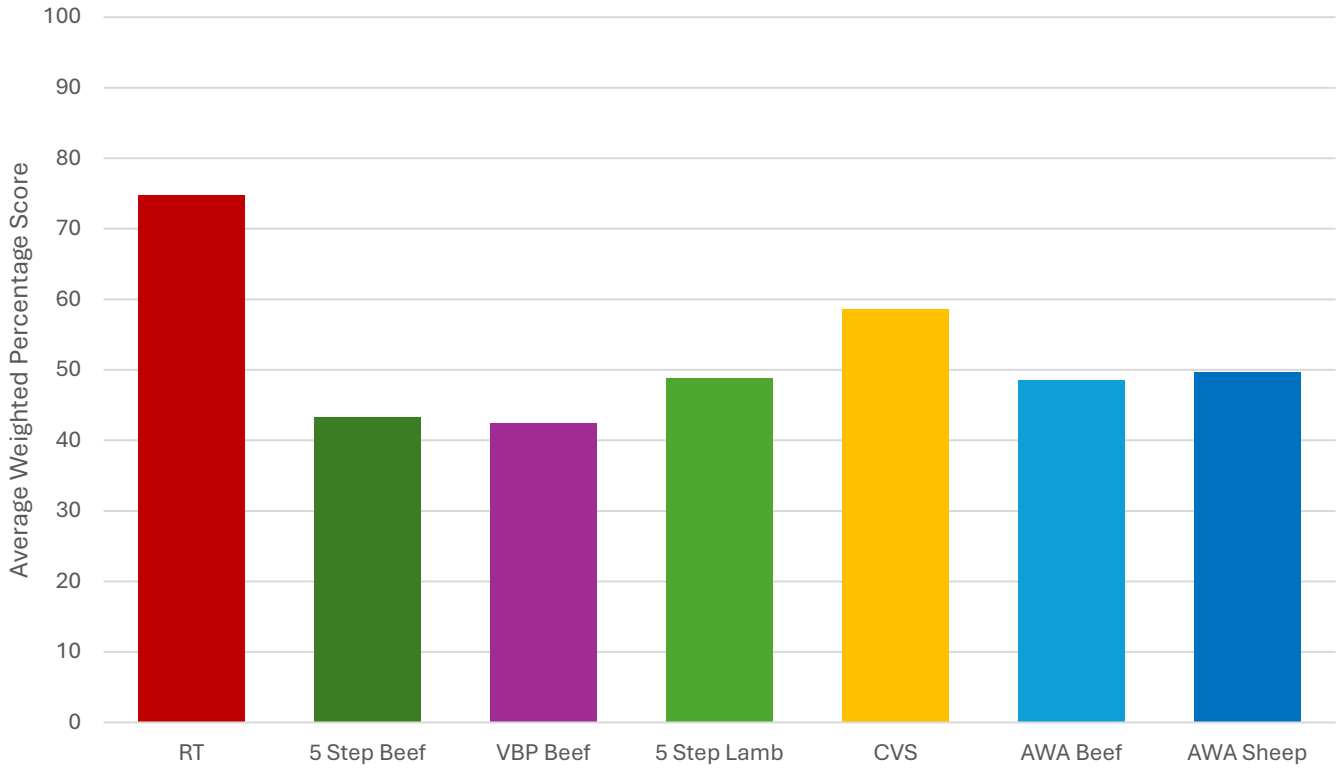

Figure 16 shows that RT achieves a higher average score than the other schemes in this study. It is important to recognise however that there are some categories in which other schemes display higher performance than RT. Five Step Lamb scores higher in both the Feed and Water and Husbandry Procedures categories, whist Five Step beef equalled RT in Feed and Water. AWA Beef and AWA Lamb both scored higher in the Youngstock Management category. CVS scored higher in the Animal Health and Welfare category and equalled RT in Biosecurity and Disease Control. There are learnings for RT within these other schemes.

Overall, RT performs at least adequately in each category, and in general is more prescriptive and detailed than the other schemes and consequently scores more highly in comparison with other assurance schemes.

Appendix 1. Category questions

Traceability, Documentation and Assurance

A. Are cattle individually identified on the farm of origin?
B. Are sheep individually identified on the farm of origin and linked to a dam?
C. Is tagging/identification required close to time of birth for cattle?
D. Is tagging/identification required close to time of birth for sheep?
E. Is there a central database recording all farm movements?
F. Do cattle movements have to be individually reported to a central database within an acceptable timeframe? (inside 3 days)
G. Do sheep movements have to be individually reported to a central database within an acceptable timeframe? (inside 3 days)
H. Is a Food Chain Information declaration (or equivalent) required to travel with animals which are being transported to slaughter?
I. Is the traceability system robust (Cattle)?
J. Is the traceability system robust (Sheep)?
K. Audit frequency?
L. Auditor training and standardisation?
M. Are cattle assured from birth?
N. Are sheep assured from birth?
O. Are the certification bodies required to be accredited to ISO17065, with the specific standard within their scope?
P. Do assured animals need to be transported by assured transporters to retain their approval status?

Personnel

A. What qualifications are required for farm staff?
B. Is staff induction required?
C. Is staff training required?
D. What training records are required?
E. What topics are covered in training and do these meet the needs of the farm staff appropriately?
F. How often is training required?
G. Are appropriate Health and Safety policies required?
H. Is the performance of employees reviewed regularly and appropriate training given if required?
I. Is labour provision from external providers adequately covered?

Food Safety

A. Does the scheme require actions which manage vermin infestation on the farm?
B. Does the scheme require activity to prevent chemical contamination of food?
C. Does the scheme require activity to prevent contamination of food with medicines?
D. Does the scheme require activity to ensure that broken needles or other physical contaminants do not reach the food chain?
E. Does the scheme restrict food types which can be offered to ruminants in order to prevent prion diseases?
F. Does the scheme require dietary restriction of sheep prior to slaughter to prevent contamination during the slaughter and processing process?
G. Is animal traceability robust (cattle)?
H. Is animal traceability robust (sheep)?
I. Is the assurance scheme robust and trustworthy, with adequate audit independence and frequency?

Housing & Shelter

A. Is housing well-designed and safe?
B. Does housing promote high welfare?

C. Is housing hygienic?
D. Is there adequate ventilation?
E. Is housing well-lit?
F. Is housing structurally sound?
G. Is there adequate space available for each animal?
H. Are loading and unloading facilities available and to a good standard?
I. Are there appropriate isolation and birthing facilities?
J. Is housing appropriate and safe for stock managers?
K. Do animals outside have access to appropriate shelter?
L. Are animals kept outside kept in appropriate conditions, including well drained lying areas and the absence of severe poaching?
M. Are bedding requirements appropriate?
N. Are requirements for records appropriate?

Feed and Water

A. Do animals have enough feed and water to maintain normal bodily function?
B. Do animals have easy ready access to fresh, clean water?
C. Is the feed offered to animals is appropriate?
D. Are the feed storage requirements appropriate?
E. Are Hormone Growth Promoters permitted?
F. Are any types of feed prohibited?
G. Are systems and records in place to prevent livestock being contaminated via feed?
H. Do young animals receive enough colostrum?
I. Is feeding equipment checked regularly and maintained?

Husbandry Procedures

A. Is castration permitted?
B. What age is castration permitted up to without anaesthetic and by what means?
C. What age is castration permitted to with anaesthetic and by what means?
D. Is disbudding permitted?
E. What methods of disbudding are permitted? Is anaesthetic required?
F. What methods of dehorning are permitted? Is anaesthetic required?
G. Is branding permitted? If so, hot branding, freeze branding or both?
H. Is tail docking permitted? If so, what rules govern this?
I. What other miscellaneous procedures are permitted? Are they acceptable?
J. Is mulesing permitted?
K. Who is permitted to carry out each procedure, and what qualifications are required?

Youngstock Management

A. Do animals have comfortable and safe indoor accommodation?
B. Is there adequate fresh air?
C. Is there adequate clean water?
D. Is there adequate bedding?
E. Do animals have access to appropriate amounts of feed?
F. Is there adequate light?
G. Is there adequate darkness?
H. Is there an absence of unnecessary and painful husbandry procedures?
I. Are animals able to safely and easily access feed and water?
J. Are animals permitted to be kept on their own when very young?
K. Are animals permitted to be kept on their own when older?
L. Is the animal's diet nutritious and appropriate?

Animal Health and Welfare

A. Are animal welfare scoring/outcome measures required?
B. How effective is each welfare score?
C. How regularly are welfare scoring measures required to be taken?
D. Are welfare measures reported to external organisation?
E. Is a Veterinary Health Plan required and accessible to staff?
F. Is the plan active?
G. Are medicine records fully up to date?
H. Does the scheme require isolation facilities in a separate air space?
I. Is locomotion scoring required?
J. Is body condition scoring required?
K. Is a review of the Veterinary Health Plan required?
L. Is it a requirement to regularly monitor the health of stock?
    a. How often?
    b. How often is a vet visit required?
M. Are miscellaneous circumstances, including euthanasia, well managed, and equipment controlled to maintain high welfare?
N. Are staff appropriately trained?
    a. Is a competent individual available?

Animal Medicines

A. Is medicine usage and administration appropriate?
B. Are movement documents required which show what animals have been treated and their withdrawal periods?
C. Are withdrawal periods appropriate and adhered to?
D. Are medicine storage, handling, use and disposal of a good standard?
E. Is responsible antibiotic use required and assured?
F. Are critically important antibiotics prohibited or permitted?
G. Is a central monitoring system required to permit the use of antibiotics?
H. Is sensitivity testing required prior to use?
I. Is off-label (cascade) use of veterinary medicine permitted?
J. Is a broken needle policy and records required?
K. Is the person administering medicines competent?
    a. How is this assured?
L. Are detailed medical records required (including purchase records and broken needle records)?

Biosecurity and Disease Control

A. Does the scheme require the creation of a Biosecurity Plan?
B. Does the scheme check adherence to the Biosecurity Plan?
C. Does the scheme require updating of the Biosecurity Plan?
D. Does the scheme require a known health status for animals brought onto the farm?
E. Is there a record of people, vehicles and machinery entering the farm?
F. Does the scheme require appropriate cleaning material to be available on-farm?

Livestock Transport

A. Is there a maximum permitted journey time?
B. Is there a maximum permitted journey distance?
C. What assurance requirements are there for vehicles/companies which are permitted to transport animals?
D. Is there a requirement for assured transport throughout the lifetime of the animal?
E. What are the conditions in which animals can be transported?
F. Is water/feed available during transport?
G. Is there a maximum/minimum stocking density during transport depending on species?

H. Are there speed recommendations during transport?
I. Are drivers aware of good animal welfare principles and are they effectively trained or certified?
J. Is certification and documentation in place?

Vermin Control

A. Is a plan to control vermin required by the assurance scheme?
B. Are actions other than baiting required to prevent vermin infestation?
C. Is a site survey required on at least an annual basis?
D. Is an environmental risk assessment required prior to bait laying?
E. Are dead/trapped vermin disposed of regularly?
F. Are there requirements in place to ensure that non-target animals do not have access to baits?
G. Is permanent baiting prohibited?
H. Are product label directions followed during use?
I. Is a COSHH assessment required?

Fallen Stock

A. Does the scheme require regular checks for fallen stock?
B. Are carcass storage methods acceptable?
C. Are carcass disposal methods acceptable?
D. Are on-farm disposal facilities acceptable?

Environmental Protection

A. Are pesticides stored correctly?
B. Are pesticides applied correctly?
C. Are pesticides disposed of correctly?
D. Are fertilisers stored correctly?
E. Are fertilisers applied correctly?
F. Are slurries and manures stored correctly?
G. Are slurries and manures applied correctly?
H. Are other potential contaminants dealt with appropriately?

Appendix 2. Reasoning behind weightings awarded

Country Weightings

	England Weighting	USA Weighting	Canada Weighting
Traceability, Documentation and Assurance	100	100	100
Provision of appropriate traceability and assurance was viewed as equally important in each country and consequently equal weightings were awarded to each one.			
Personnel	100	100	100
Provision of a safe working environment, with good provision of training was viewed as equally important in each country and consequently equal weightings were awarded to each one.			
Food Safety	100	100	100
The provision of safe food was viewed as equally important in each country and consequently equal weightings were awarded to each one.			
Housing & Shelter	100	120	120
Different weightings were applied to each country within the Housing & Shelter category. In England, some cattle can be permanently housed, and the majority of other cattle are housed for several months per year, as are some sheep. The weather conditions in the USA and Canada can be more extreme than in England, hence the higher weightings, which are primarily based on the need for shelter.			
Feed and Water	100	100	100
The provision of appropriate amounts of fresh feed and water is equally important in each region and therefore equal weightings have been awarded.			
Husbandry Procedures	100	100	100
It was agreed that husbandry procedures were equally important in each country			
Youngstock Management	100	100	100
Care for youngstock is equally important in each region and equal weightings have been awarded.			
Animal Health and Welfare	100	100	100
The management of animal health and welfare is equally important in each region and therefore equal weightings have been awarded.			
Animal Medicines	100	100	100
It was recognised that, in England, animals tend to be more closely managed and are more likely to be treated with a medicine. As a result, England has been awarded a slightly higher weighting for this category.			
Biosecurity and Disease Control	100	100	100
Biosecurity and disease control is vitally important across each region in this study.			
Livestock Transport	100	150	150
Conditions during transport were recognised as being more important in the USA and Canada because of the potentially much greater distances over which animals may be transported.			
Vermin Control	100	80	100
Vermin control is proportionately more important where there are larger amounts of housing and storage of feed for animals (particularly cereal based feed). Because housing is less common in the USA than in the other two regions, vermin control was weighted lower.			
Fallen Stock	100	90	80
Management of fallen stock is proportionately more important where farms are smaller and farmed more intensively. It is also more important where there is a raised likelihood of proximity to watercourses, or to the general public. different weightings that have been applied, due to the greater intensity of production in England compared to the USA and Canada.			
Environmental Protection	100	100	100
Environmental Protection was viewed as equally important in each country and consequently equal weightings were awarded to each one.			

Category weightings

Heading	Relative Weighting
Traceability, Documentation and Assurance	200
The traceability and assurance category was awarded the highest category weighting because it was agreed to be the single most important aspect of a farm assurance scheme. Product from each farm must be traceable, and the assurance scheme must be robust and trustworthy. If this is not the case, the scheme does not offer effective assurance, hence the high weighting for this category.	
Personnel	110
The training, management and safety of farm workers is important, but a lower weighting has been awarded because this is not the main purpose of farm assurance schemes, and thus this category is of lower importance than, for instance, traceability or food safety.	
Food Safety	200
Food safety is the primary reason for the creation and implementation of farm assurance schemes and hence the highest weighting has been applied to this category.	
Housing & Shelter	120
Housing and Shelter of animals is recognised as important for the welfare of animals, but is not the most critical component of this, hence a medium rating has been awarded to this category,	
Feed and Water	150
Feed and Water is vitally important to animal welfare. As a result, the second highest weighting has been applied to this category.	
Husbandry Procedures	150
Husbandry Procedures can have a significant impact on animal welfare. As a result, the second highest weighting has been applied to this category.	
Youngstock Management	105
Youngstock Management is important but does fall under other categories within farm assurance and therefore a weighting of 100 was awarded.	
Animal Health and Welfare	150
Effective management of animal health and welfare has a significant impact on animal wellbeing. As a result, the second highest weighting has been applied to this category.	
Animal Medicines	150
The use of animal medicines strongly impacts animal wellbeing. As a result, the second highest weighting has been applied to this category.	
Biosecurity and Disease Control	150
Biosecurity is important to the ongoing wellbeing of stock, through the prevention of transfer of disease. As a result, the second highest weighting has been applied to this category.	
Livestock Transport	95
Livestock transport, while important, only represents a relatively short proportion of the animal's life, and as a consequence, a lower weighting has been applied.	
Vermin Control	70
Vermin control does have some impact on disease transfer and food safety, but for livestock production, its impact is relatively low and hence a lower weighting has been applied.	
Fallen Stock	70
Fallen stock has some impact on the overall wellbeing of flocks or herds, and on the environment around the farm, but its impact is generally fairly limited. This category has therefore been awarded a relatively low weighting.	
Environmental Protection	150
Protection of the environment through the responsible use of chemicals and manures is extremely important. The implementation of good practice significantly reduces run -off and pollution events and consequently this category has been awarded a high weighting.	

Appendix 3. Table showing the principles of how scores were awarded within each category

The following table outlines the general principles which were used assist decision making when deciding on the scheme scores for each question within each category. A degree of judgement had to be applied when awarding scores, but there was very good agreement amongst the experts on the final scores awarded.

Score	Qualitative description matching each score
1	Scheme fails to address the topic of the question
2	Scheme recognises the issue, but fails to address it
3	Scheme recognises the issue and makes some attempt to address it
4	Scheme recognises the issue and addresses a minority of components but misses the majority of key details
5	Scheme recognises the issue and addresses the majority of components, but is not fully credible
6	Scheme recognises the issue and credibly addresses it, but misses out several important details
7	Scheme recognises the issue and addresses it quite well, but misses out one or two important details
8	Scheme answers the question well, and does not miss any important issues. However, it fails to address three or more minor issues
9	Scheme almost answers the question ideally, but misses out on one or two minor details
10	Scheme fully answers the question, enabling the end user to be sure that the issue is managed to a high level