

Beef Event:

South West Scotland

Practical Tips for Improved Production
Easterbrook Hall Crichton Campus, Dumfries DG1 4TA
Wednesday 3rd October

12.30pm: **Buffet lunch**

1.30pm: **Programme:**

- **The farmer's perspective**
Willie Davidson of Poldean, Moffat
- **The beef market and cattle finishing**
Gavin Hill, Kev Bevan, SAC
- **BVD and Johnes**
Colin Mason, Franz Brulisauer and
Antonia Ganser, SAC

- **Avoiding difficult calvings**
Cathy Dwyer, Ian Pritchard,
SAC
- **Improving herd fertility**
Iain Riddell, George Caldwell,
SAC
- **Better cattle handling**
Jimmy Hyslop, SAC
- **Meat Eating Quality**
Geoff Simm, SAC



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Beef Market Outlook

Exciting, if challenging, times lie ahead for the Scottish beef industry. While cattle prices are generally expected to improve across the EU in coming years, considerable changes in the structure and way the industry works are anticipated. The main factors expected to influence the beef industry over the next 10 years are considered below.

Short term

The finished price of Scottish cattle has strengthened since the disappointing mid summer levels, with a healthy price premium over English and Irish cattle. Fortunately the prevailing outbreak of foot-and-mouth disease (FMD) has not hit the cattle industry like the sheep industry. That said, a true assessment of the industry must await full resumption of suckled calf and store sales. For the price of calves and stores will reflect how finishers view prospects in the coming 12 months.

The fear is that finishers, suffering big losses on stores and calves bought last spring, will overcompensate in their bidding in the coming year. This “see-sawing” of prices could destabilise the production base of the Scottish beef industry. What should finishers be taking into account in setting their bidding limits?

On the plus side, BCMS data shows that there are less prime cattle in the pipeline. Also, poultry and pig meat is less competitive given the record rise in feed costs. However, the surging cost of cereals (and generally mediocre silage quality) also hits cattle finishing and lamb will almost certainly be heavily discounted on the shelves in the months ahead. Until live cow exports resume, cow beef will also overhang the domestic market. The big unknowns are: will producers finish cattle earlier (and lighter) to lower feeding costs; will less breeding heifers be retained if producers cut herd sizes; and, will the EU vet mission to Brazil call for a ban on Brazilian imports.

Medium term

The Scottish beef industry is very different to the European beef industry. Whereas the suckler herd is the main source of beef in Scotland, across the EU dairy bred beef is more common. So the long term decline in the EU dairy herd is the main reason the European Commission expects beef production to decline. The Commission also predicts that the decoupling of headage subsidies will also slim down the suckler herds of countries like Scotland. Without direct support QMS costings show that most Scottish suckler herds are losing money. However, there is a fair chance that new targeted agri-environmental (Pillar 2) payments may help underpin suckler production in the uplands. Though such payments could see a change in the type of cow run.

The competitiveness of dairy beef could be a major issue in future. Despite the current high cost of milk powder and cereals, dairy crossbred calves benefit from their low overheads (ie, they are a by-product of dairying). With a positive outlook now forecast for milk prices, will cow numbers drop as Brussels predicts? Also, will increased use of sexed semen perhaps significantly lift the proportion of valuable crossbred calves coming from the national dairy herd? Suckler beef may therefore need to focus even more on the top end of the market place. Consumers are already prepared to pay premiums for organic and Angus bred beef.

South American imports are forecast to grow in the medium term to fill the EU beef deficit. If a new global trade agreement is not reached, the chances are that a bilateral trade agreement with South American countries will. Food price inflation is a major concern of politicians, while supply guarantee is an issue for the major retailers. Regional disease

outbreaks mean that big buyers will procure from a number of countries to feed their supply chains. Ensuring that the biosecurity and traceability of the Scottish beef industry is second to none is therefore critical in giving the big buyers confidence to support local supply. Processing companies also have a major vested interest in keeping a healthy production base – their own futures!

Long term

Global population growth and rising incomes in developing countries means that demand for meat will continue to grow. The new east European countries that have recently joined the EU should provide good demand growth close to home. However, pig and poultry meat is expected to meet most of this growth. The prospects in Asia are similar but even a small percentage rise in beef consumption equates to large tonnages. But the competition in this marketplace from South America, Australia and North America will be tough.

These countries, especially the South Americans, are also likely to get increased access to the lucrative EU marketplace in the long term. The next major reform of the CAP, due for implementation in 2014, will probably call for a further reduction in trade barriers and phasing out of Pillar 1 support.

Ongoing improvement in the competitiveness of the Scottish beef industry must therefore be the priority. Besides learning new ways to lower production costs, improved competitiveness will require a grading system that sends the right signals to producers and a more coordinated relationship between producers, processors and retailers.

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Finishing Cattle – The Options For Fast And Cost-Effective Finishing

With cereal prices at an all time high the great debate currently revolves around using a high level of feed for a short time or less feed for a longer time. Table 1 shows the effect of level of concentrate supplementation with average quality silages (240 g DM/kg; 10.6 MJ ME/kgDM) for a steer in the mid-point of the finishing period. There are four levels of feeding with the daily feed costs and the cost per kg gain.

**Table 1 Effect of level of concentrate supplementation
Average quality silage - mid point ration**

Level of concentrates (kg/day)	3	5	7	Ad-lib cereals
Daily liveweight gain (kg/day)	0.91	1.14	1.31	1.40
Silage (kg/day)	30.7	25.9	20.3	1 (straw)
Cost/day (p)	91.1	113.9	135.5	170.5
Cost/kg liveweight gain (p)	100.1	99.9	103.4	121.8

On the silage based diet the cost per kg gain doesn't vary greatly but costs per day does. Those feeding high levels of concentrate will have higher costs per day but with less days – see Table 2.

Table 2 shows the costs to finish a forward store steer and includes other fixed and variable costs.

Table 2 Total costs to finish (550 to 650 kg)

Level of concentrates (kg/day)	3	5	7	<i>Ad-lib</i> cereals
Days to gain 100 kg	110	88	76	71
Slaughter date (start 1 October)	19 January	28 December	16 December	11 December
Feed costs (£/head)	100	100	103	121
Other costs ⁺ (£/head)	62	49	43	40
Total cost (£/head)	162	149	146	161

+ other fixed and variable costs 56p/day

This table demonstrates the importance of still being able to carry out fast finishing on silage based diets. (Please note that it does not take into account different finishing dates when prices may vary). If quality silage is available then lower levels of concentrates can be fed than with *ad-lib* cereal diets while still achieving good performance with lower costs. To be sure of achieving the performance in the tables then the silage quality must be known.

Table 3 shows the situation for finishing a 13 to 14 month store steer.

Table 3 Total costs to finish (440 to 640 kg)

Level of concentrates (kg/day)	3	5	7	<i>Ad-lib</i> cereals
Days to gain 200 kg	220	176	152	142
Slaughter date (start 1 October)	9 May	26 March	2 March	20 February
Feed costs (£/head)	200	200	206	242
Other costs (£/head)	124	98	86	80
Total cost (£/head)	324	298	292	322

Again fast finishing is cost effective and requires high levels of concentrate. In order to avoid digestive upsets, no more than 2 to 2.5kg of concentrates should be fed in one meal. Therefore, these high levels of concentrates require two or three meals per day or a total mixed ration. Feeding less concentrates per day increases the number of days to finish. Often very little feed is saved overall as although there may be less fed per day, there are more days.

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Bovine Viral Diarrhoea (BVD) – facts you need to know

What is BVD ?

BVD is a widespread cattle disease caused by the BVD virus (BVDV). Infection can result in serious economic losses in both beef and dairy herds. The disease is found world-wide and is present in the UK.

How do animals suffering from BVD appear?

The clinical symptoms are unspecific and vary depending on the virus, the animal's immune status and, in case of affected dams, their stage in reproductive cycle.

Adult, non-pregnant cattle usually show little to no overt clinical symptoms. In *lactating cows* a drop in milk yield can be observed. The most dramatic effects observed are on reproductive performance. Cows will show poor fertility with high return rates due to reduced conception and early embryonic death. In *pregnant cattle*, the virus crosses the placenta and infects the unborn calf. Depending on the stage of gestation at the time of infection,

abortions, stillbirth, birth of malformed calves, birth of weak calves and birth of ***persistently infected*** calves can be observed.

Acute, clinical BVD is usually seen in *cattle aged 6 - 24 months*. These animals may show depression, fever, diarrhoea, oral lesions, poor appetite and runny eyes and nose. BVD causes immuno-suppression, thus affected cattle are prone to concomitant infection with other disease agents. The severity and duration of other diseases, like pneumonia, is enhanced by BVD, often leading to death of the affected animals.

Mucosal disease (MD) is an invariably fatal disease of ***persistently BVDV infected animals*** that normally occurs at 6-18 months of age. Signs of MD are profuse, treatment-resistant diarrhoea, progressive weakness and lack of appetite, erosive lesions of the nasal and oral mucosa (hence the name MD), the coronary band and interdental cleft.

How is BVD spread?

PI's are the main route of spreading infection, as they produce and shed the causative virus continually in large amounts. The most likely way to introduce BVD to a naïve herd is by buying in dams carrying a PI foetus or stock persistently or acutely infected with BVDV .

What are persistently infected animals (PI's)?

When the dam and thus the foetus are infected before 125 days of gestation, the immature immune system of the foetus will not recognise the virus as a disease agent. This allows the virus to establish lifelong infection. When born, these calves carry and shed BVDV and become the main reservoir for infection of other cattle. Most PI's die before they reach maturity from mucosal disease or secondary diseases such as pneumonia. Some PI's reach reproductive age with PI dams always producing PI offspring and PI bulls shedding virus continually including in their semen.

Is BVD a problem in your herd?

Upon first exposure of a susceptible herd to BVDV, losses may be substantial. However, due to the unspecific symptoms the presence of BVD may stay undetected in a herd. If you frequently observe some of the clinical signs discussed above you should ask your vet to check for BVD, who will then take blood or milk samples for laboratory tests.

How can you prevent and control BVD on farm level?

Herds without BVD must aim to prevent its introduction. This can be achieved by either keeping a closed herd, or, if animals are bought in, by sourcing them from accredited herds and/or isolating and testing them for BVDV. Once present, BVD control and eradication plans depend on your herd structure and management practices. A key point is detection and removal of PI animals. For some herds vaccination, along with good biosecurity, can help in preventing reproductive disease and the production of PI animals.

What's being done about BVD in the UK?

Currently there is no official programme for control or eradication of the disease in the UK. However, BVD is addressed in a number of health schemes. Shetland has successfully eradicated the disease.

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Control of Johne's Disease in The Suckler Herd

Johne's Disease is an incurable, progressive gut disease caused by the bacterium *Mycobacterium avium paratuberculosis*.

- Affected cattle die mostly at 3-5 years of age
- Infertility and poor milk yield precede signs of disease
- Most herds are infected by the purchase of apparently healthy cattle that have come from infected herds, particularly bulls
- The bacterium is passed in large amounts in the faeces but can also be found in milk and particularly colostrum
- For every clinical case seen in a herd up to 25 more animals may be infected
- Keeping homebred replacements increases the risk of infection building up in the herd, if no control measures are put in place

Costs of Disease

The replacement costs for a cow going out of the herd after 2 calves compared with the target of 8 calves are quadrupled. Using an average cost of £800 for a replacement heifer, a cull value of £280 and a target of 8 calves produced in the normal lifetime of a cow, the replacement cost per calf is £65.00. For a cow culled with Johne's Disease where the cull value will be closer to £200 the replacement cost is £300 per year.

The cost to a 100 cow herd losing 5% of their cows to Johne's Disease each year will be £1500 per year. In addition there may be the occasional loss of a purchased bull after a season in the herd and representing a loss of around £2000 depending on purchase price. The productivity of a herd with Johne's Disease may deteriorate to the stage where the production targets necessary for financial survival will not be met.

Practical steps to the control of Johne's disease

- ◆ **How do you know if you have a problem?** – If cows are wasting and scouring consult your vet. Laboratory testing of blood and dung allows the diagnosis to be confirmed.
- ◆ **How can you prevent the disease entering the herd?** – Blood sampling of animals at purchase is of limited value because animals only test positive in the later stages of the disease. Purchase bulls (and replacements where possible) from herds accredited free of infection. Where this is not possible test added animals each year before breeding and do not use if the test is positive.
- ◆ **How can you limit the spread of infection within the herd?**
 - Colostrum – Do not feed pooled colostrum or colostrum purchased from a dairy herd.
 - Hygiene – It is vital to reduce dung contamination of cows and calves. Ensure clean calving boxes. Fence off dirty water holes. Provide mains water.
 - Test and cull – annual blood test, cull positives and do not retain calves from positive cows for breeding.
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- ◆ **How can you demonstrate freedom from the disease?** – Cost of Control – Within SAC, the Premium Cattle Health Scheme membership costs £60. Individual lab tests are £4.00 per test. For a 100 cow herd with 3 bulls the costs are £472 per year. Your veterinary surgeon will also charge for their involvement in collecting the samples and advising on control.

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Difficult calvings – what is the cost?

Calving difficulty is predominantly a problem of heifers with up to 25% of heifers requiring assistance to deliver their calves in some herds. Calving problems are less frequent in cows but are still estimated to be 1 - 5% of all births.

Why is it a problem?

Calving difficulty can cost you money in many ways, some of which might not be obvious but are the long term costs of a difficult birth process on the cow and/or calf:

- Time and labour issues with assisting deliveries
- Increased mortality of calves – up to half of all calf deaths occur because of a difficult calving.
- Low vigour in surviving calves – calves that survive a difficult birth take longer to stand, longer to reach the udder and sucking can be delayed.
- Hypothermia in surviving calves – calves that have had a difficult delivery and been without oxygen during birth can have a reduced ability to maintain their body temperature after birth. These calves are vulnerable to low temperatures and can die from hypothermia.
- Particularly in heifers, a difficult birth may disrupt the onset of maternal behaviour so that the calf may not be mothered up properly.
- A difficult calving increases the chance of other reproductive problems – a cow is more likely to suffer from mastitis, not cleansing etc. after calving problems. She may also have lower milk yield (affecting calf growth), and may take longer or be more difficult to get back in calf.
- Cows are more likely to be culled if they have a difficult calving.

Why does it happen?

The risk factors for calving problems are:

- Experience – heifers are 5-12 times more likely to need assistance than cows
- Calf birth weight and particularly the ratio of calf weight to cow weight
- Dam pelvic area (and dam size and age)
- Sex of the calf – bull calves are more likely to need help than heifer calves
- Breed and sire within breed – some breeds are more likely to cause problems at calving than others (generally more problems with continental breeds), also particular bulls have more birth difficulty than others.

What can you do to reduce calving difficulty?

As calving difficulty is especially an issue for heifer calvings paying particular attention to management and mate choice of heifers will pay dividends in reducing problems. Optimal calf to cow weight at birth is for calves weighing between 6-8% of the cow weight. Lighter calves are more likely to be weak, low vigour calves; heavier calves are likely to have calving difficulty. So management of animals to prevent excessive weight gain in pregnancy will help to prevent calving problems and calf mortality. Breed selection and particularly selection of bulls with EBVs for calving ease, especially for heifers, will also reduce calving problems.

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Reducing Calving problems – Choice of Bull

One of the five key principles for improving fertility is the avoidance of difficult calvings.

Difficult calvings are not only stressful on the cow but can often leave the farmer stressed. Dead cows, cows that fail to rebreed, dead calves, injured calves, labour costs at calving and veterinary assistance all impact on profitability of the suckler enterprise. With less labour on farms it is essential that calving is largely unaided.

The tools are available to help achieve a stress free calving. The merit of using Estimated Breeding Values (EBV's) in the purchase of stock bulls is well recognised by the livestock industry as a means of improving growth rates and the carcass quality of suckled calves. EBV's are also available for the traits linked to calving performance. These are Gestation Length, Calving Ease and Birth Weight.

Choosing a sire with Gestation Length EBV and/or Birth Weight EBV and/or Calving Ease EBV better than the respective breed averages will help to mitigate against calving problems. If homebred replacements are kept, sires with a short gestation length EBV and low birth weight EBV will give a long-term benefit to profitability.

Often at sales the Calving Value is published. This is constructed from the Gestation length and Calving Ease EBV's.

SAC recommends attention to calving EBV's when purchasing a bull. However, care needs to be taken to ensure that the bull also has satisfactory EBV's for growth and muscle traits and also maternal traits if being used to breed replacements. The correct balance of traits should be chosen according to herd requirements.

It should also be remembered that the bull is only half the herd and is readily blamed for calving difficulties. Condition of the cow can play a big part.

REDUCE STRESS on cows and yourself by using the **EBV's for CALVING**.

Average and Top 10% Calving EBV's

	Charolais		Limousin	
	Average	Top 10%	Average	Top 10%
Gestation Length	1.2	-0.2	0.2	-1.4
Calving Ease	-5.4	2.2	-1.5	0.5
Birth Weight	2.4	1.1	1.1	0.2
Calving Value			LM1C	LM3C

At the forthcoming bull sales figures will be available for all breeds. If they are not displayed with the bull they will be available from Signet or the respective breed societies.

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Assessing and Improving Suckler Herd Fertility

Results of recent surveys suggest that it is possible to significantly improve the “average” herd’s performance by adopting some fairly straightforward measures. According to QMS Figures the average Scottish suckler herd weans 88 calves for every 100 cows and heifers to the bull. We see a range of performance but note that the best performers can consistently exceed 95 calves reared for every 100 cows mated. This consistency comes simply from good management that minimises the chance of things going wrong be this infertility, calving problems or calf losses.

Targets for improved fertility

- ❑ Calvings per cow and heifer put to the bull – 95%.
- ❑ Barren cows – 5% or less.
- ❑ Cows calving in first 3 weeks – 65%.
- ❑ Bulling periods – 9 weeks for cows and 6 weeks for heifers.
- ❑ Calf mortality birth to weaning – 2%.

Assessing the value of improved fertility

The table below shows (a) the value of improving percentage calves reared (per cow and heifer put to the bull) from 88% to 94%, and (a+b) then raising the average calf weaning weight from 285 to 315kg.

	current performance	(a) improve % reared by 6 calves	(a+b) improve weaning wt by 30kg
calves reared %	88	94	94
av weight per calf kg	285	285	315
av calf wt per cow kg*	251	268	296
average price p/kg	1.25	1.25	1.25
Output per cow	£314	£335	£370
Change in output		£21	£57
Change for 100 cow herd		£2,138	£5,662

- 6 extra calves improves output by £21 per cow per year or £2138 for 100 cow herd
- 30kg extra weaning weight (achieved by having more calves born in the early part of the calving period) improves output by a further £35/cow to a cumulative £5662 per year for 100 cows.

Key areas to tackle

- ❑ Management of replacement heifers – bulling weights, tight mating, preferential treatment – this is the key factor.
- ❑ Checking bull fertility – soundness, fertility testing, checking records. Managing cow condition – year round, but particularly condition score at calving.
- ❑ Avoiding difficult calvings – cow condition and bull EBV’s.
- ❑ Health planning and avoidance of disease problems – discussing your farm situation with your vet.

Why tighten the calving pattern?

- Saves labour – supervising calvings, working on even batches of calves.
- Reduces the incidence of difficult calvings later in the calving season due to over fit cows.
- Reduces risk of disease transfer from older to younger calves.
- Increases average weight at weaning.
- Increases average age and weight of heifers at bulling – vital for calving down at “2 years of age” and subsequent fertility.

SAC Suckler Herd Fertility Benchmarking Format

SAC have devised a simple and robust system to allow farmers to assess their herd performance, to allow comparisons with others performance, to use as the first step for identifying ways of improving fertility, or dealing with problem cases. A typical example can be seen below. Contact your local adviser if you would like to assess your suckler herd.

Spring calvers 2005			
	Combined		Target
Per cow/heifer mated			%
	Number	%	
Cows/heifers to bull	120		
Cows/heifers calving	110	91.7%	95%
Cows/heifers barren	8	6.7%	5%
Cows/heifers aborting	2	1.7%	
Cows/heifers mortality (mate-calv)	1	0.8%	
Cows in calf but culled	0	0.0%	
Calves weaned	106	88.3%	94%
Per cow/heifer calving			
	Number	%	
Cows/heifers calving 1st cycle	49	44.5%	65%
Cows/heifers calving 2nd cycle	35	31.8%	25%
Cows/heifers calving 3rd cycle	14	12.7%	7%
Cows/heifers calving 4th cycle	7	6.4%	3%
Cows/heifers calving 5th cycle	5	4.5%	
Cows/heifers calving later	0	0.0%	
Total calving	110		
Per calf born alive			
	Number	%	
Cows/heifers with stillborn calves*	2		
Twin births (live twins only)	4		
Total born alive	112		
Dead calves (birth-48 hours)	4	3.6%	2%
Dead calves (48 hrs - weaning)	2	1.8%	combined
Calves weaned	106	94.6%	96%

Interpreting the example data – identifying areas for improvement

- ◆ Although almost 92% calved and barren rate was just above target at 6.7%, the herd reared 88.3% calves, which is well below our target of 95%.
- ◆ Two cows aborted and investigation is necessary into cause of abortion.
- ◆ Six calves died before weaning – 4 of these were within 48 hours of birth and may be linked to calving difficulty (check bull ebv's).
- ◆ Two calves died thereafter – what were the reasons?
- ◆ Calving spread is too protracted – cull or sell 9 cows that calved over 12 weeks from start of calving.
- ◆ Need more cows calving in first three weeks to improve weaning weights and pool of replacements fit to bull at 15 months of age.

Further detail can be found in the QMS Booklet – “Improving Suckler Herd Fertility” available through QMS and at your local SAC Office.

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Safe Cattle Handling Systems

Poorly maintained handling facilities and designs that make excessive use of the handler being in direct contact with the animals can significantly increase the risk of injury when handling beef cattle. Safe systems have always been important but ones that can be operated by one person are increasingly needed. Both of these requirements can be met by designing handling layouts that minimise fear and distraction to encourage calm movement in the desired direction.



In the USA, Canada and Australia handling systems that can operate efficiently on a large number of animals have been designed based on making use of the animal's behaviour to aid movement. Some of the general principles that have been shown to work in these countries could be implemented in the UK also. **Key features include** providing the animals with only **one clear exit** by sheeting the sides of races and pens, which also prevents disturbance from nearby animals and handlers. Several other principles become intuitive if a handler walks through a system and sees it from the animal's perspective. A long straight race obviously leading to a crush, which is associated with aversive experiences and has several handlers standing nearby will not encourage forward movement. The use of a **gently curving race** with only a short section before the crush will encourage the animals to move forward as the only obvious escape route.

Whilst changes such as these have a cost implication, **some low-cost changes can also be made to existing systems** which will greatly improve the ease of movement. An example is removing objects which, when seen from inside the race, appear to block the exit of the crush.

Two **SAC technical notes** have been produced which give other suggestions on ways of modifying existing systems to improve movement (TN564) and suggestions for new builds (TN 565).

For further information, visit:

<http://www.sac.ac.uk/research/animalhealthwelfare/beef/handlingsystems/>

This site provides a range of diagrams, recommendations, photographs and copies of the technical notes. For farm-specific advice, contact your nearest SAC advisory office (see the sac website www.sac.ac.uk)

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Meat Eating Quality – A Whole Chain Approach

SAC and partners recently completed a major SEERAD-funded research project intended to help the Scottish meat industry enhance its strong international reputation. The SAC-led consortium included experts from Biomathematics and Statistics Scotland (BioSS), the University of Bristol, the University of Newcastle, and Scottish Food Quality Certification Ltd. (SFQC) with additional input from Quality Meat Scotland (QMS). The group tested 'packages' of practices across the supply chain that are expected to lead to enhanced eating quality of beef, lamb and pork. The research involved 13 of the major meat processors in Scotland and over 100 farms.

Some practices that improve meat eating quality

On farm/pre-slaughter	Post slaughter
Avoiding growth checks Feeding and managing to achieve reasonable growth rates Careful handling and transportation of animals Minimising mixing of unfamiliar animals Avoiding slaughter soon after diet changes	Considerate chilling of carcasses Electrical stimulation of carcasses Hip-bone hanging of carcasses Conditioning of meat

The results of this trial, for pigs, beef and lamb, suggest that good farm practice with respect to factors that affect eating quality is already widespread in Scotland. However, it is vital that 'best practice' husbandry standards – achieving good growth rates, avoiding growth checks and diet changes just before slaughter, and minimising stress - are maintained to ensure high eating quality.

In all 3 species, enhanced post-slaughter processes – involving techniques such as electrical stimulation, hip suspension and conditioning of carcasses - had important beneficial effects on meat eating quality, as judged by trained taste panellists and (for beef & pigs only) volunteer consumers testing the meat at home.

Current SAC R&D on Meat Eating Quality

The efficiency of red meat production and marketing could be improved by better techniques for measuring carcass and meat quality. We are currently comparing a range of techniques for improved measurement in beef and lamb in a new SEERAD-funded R&D programme. These include ultrasonic and video image (VIA) measures and DNA-based tests (genetic markers) on live animals, and near infrared reflectance, computed tomography, and shear force measurements on meat samples. We are examining these for their usefulness in breeding programmes, or 'on-line' in processing plants.

We are also investigating the effects of several markers on carcass yield and quality, and validating sheep VIA measures, in projects funded by SEERAD, Defra, QMS, EBLEX, HCC and others.

For more information

- See the QMS DVD '*Meat Quality: Science Into Practice*'
- Visit www.sac.ac.uk

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