



McDonald's Europe Flagship Farms

Blade Beef – Upper House Farm, UK

The focus of this case study is to highlight how high-quality beef can be produced economically, taking into account animal welfare, and tackling the aspect of rearing black and white bull calves from the UK's dairy industry.

This case study highlights good practice in animal welfare and ethics, farm economics, and the reduction of GHG emissions.

The McDonald's Flagship Farms scheme has been developed in co-operation with the Food Animal Initiative to showcase good agricultural practices which are environmentally sound, economically valuable and ethically acceptable. A limited number of 'flagship' farms have been selected from within the McDonald's supply chain to represent progressive agricultural practice.

The following matrix has been developed by McDonald's to help assess sustainability within the agricultural supply chain. Farms selected demonstrate good practice in at least one of the matrix key areas, whilst also operating to generally high standards in all other areas.

Symbols    are used to highlight good practice in environmental, economical and ethical issues.

McDonald's Good Practice Matrix

Ethical (acceptable practices)

Human health & welfare

- i Employee health & welfare
- ii Food safety

Animal health & welfare

- i Nutrition 
- ii Medication & growth promoters 
- iii Genetic selection 
- iv Animal cloning
- v Husbandry 
- vi Transport
- vii Slaughter

Business ethics & supplier relationships

Rural landscape preservation

Environment (protecting the planet)

Climate change

- i Greenhouse gas emissions 
- ii Energy efficiency & renewables

Natural resources – soil

- i Soil fertility & health
- ii Soil erosion, desertification & salinisation
- iii Soil contamination

Natural resources – water

- i Water pollution
- ii Water usage efficiency 

Natural resources – air

- i Air emissions

Agrotechnology

- i Agrochemical usage
- ii Bioconcentration & persistent organic pollutants
- iii Genetically modified organisms

Ecosystem protection

- i High conservation Value Land (HCVL)
- ii Habitat & species preservation

Waste

- i Production waste
- ii Hazardous waste
- iii Waste to landfill

Economics (long-term economic viability)

Sufficient high quality production

- i Producer income security & access to market 
- ii Agricultural input costs 
- iii Crop & livestock disease 

Community investment

- i Local employment & sourcing
- ii Support for community programmes


Good practices demonstrated in this case study

Executive summary

Key areas of good practice:

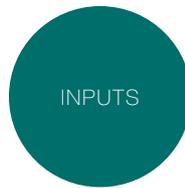


All cattle on the farm are reared under the requirements of the Assured British Meats Standard. The farm agrees to abide by a code of practice covering issues such as stockmanship, welfare, nutrition, use of veterinary medicines, animal traceability and

environmental controls, which is all independently audited and certified by an accredited inspection company.

The farm is a member of “Blade Farming” which is a fully integrated beef supply chain in the UK. Blade Farming supplies

over 16,000 head of beef annually, enabling the farm to take advantage of the economies of scale of working with a large business while benefiting financially through the rearing and finishing contracts on offer.



Currently Blade farming is purchasing and supplying black and white bulls calves from the UK's dairy industry to the farm at two- to four-weeks of age. These calves, which may have been culled shortly after

birth (as they had little or no economic benefit), are reared professionally and return a profit for both the farm and Blade.

On arrival at the farm, the calves are divided into

groups according to their size and weight. This policy minimises stress and bullying of smaller calves.

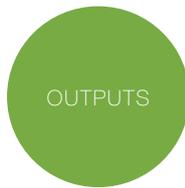


A meticulous regime of preventative health care is followed for all animals entering the unit. Calves can be sourced from several farms, so it is crucial that any potential health issues are addressed. A comprehensive vaccination programme is in place to increase

the animals' immunity to potentially serious diseases and infections.

Well-ventilated, dry housing with low humidity provides the animals with ideal environmental conditions to grow and remain healthy. Along with the vaccination

policy, this approach has resulted in a mortality rate of under 2% which is excellent when compared with the latest 'RADAR' cattle book figures (published by Defra) stating the mortality rate for dairy calves as 14% and for beef calves, 7%.



Animals are reared and finished to good husbandry and dietary standards. Preventative healthcare, optimal housing, good nutrition and excellent stockmanship, enables the farm to finish their

continental steers in 480 days at 324 kilograms deadweight (against an industry average of 692 days at 326 kilograms). This also reduces the carbon footprint of the beef enterprise.



The large finishing shed, covering an area of 1600m², has been designed so that all the rainwater falling on the roof is diverted into an underground tank and is used as drinking water for the cattle. This results in annual savings of over £2000.

Summary of actions and benefits

Action		Benefits		
		Environment 	Economics 	Ethics 
Management	The farm is independently inspected under the Assured British Meats Standard	Ensures the farm complies with environmental legislation	Allows the farm to market the cattle as 'assured' and therefore receive a higher price than nonassured cattle	Ensures the farm meets certain welfare standards and legislation
	A member of Blade Farming		The farm receives a contracted payment for every calf reared with an additional 20% bonus paid if all the KPIs are met	
	Using the Blade Farmworks IT programme		A single recording system reduces the amount of time the farm spends on paperwork as this also covers the record keeping requirements of legislation and farm assurance	All medicine treatments are recorded on this internet based system which can closely monitor any withdrawal times
Inputs	Rearing black and white dairy bull calves		The Blade system guarantees a set payment for every calf reared and offers contracts for finishing cattle	Rearing calves which could otherwise be culled at birth as they are deemed uneconomic
	Stable social groups retained throughout animals life		Improved growth rates and health	Less aggression as the animals have an established hierarchy which is not repeatedly disrupted
	Calf sourcing policy			85% of calves are sourced direct from farm and therefore encounter reduced stress and disease challenges
Operations	All stock are bedded on straw			An excellent substrate for cattle to lie on
	Targeted health planning programme		A planned vaccination policy reduces the risk of animals getting a respiratory disease which can cost over £80 per calf	Focus on preventative health care rather than treatment – improved animal health
	Good housing and ventilation	An animal achieving its performance potential will reach a slaughter weight quicker and therefore reduce potential GHG emissions	A healthy environment reduces disease challenges to the animals resulting in them attaining their optimum performance potential	Animals are provided with optimum housing conditions which are not detrimental to their health
Outputs	Healthy animals reared to their performance potential	212 fewer days to reach slaughter weight substantially reduces the animal's GHG emissions	The farm finishes animals at 480 days of age at 324 kg DW (compared to average 2008 EBLEX figures of 326 kg at 692 day)	Good animal health is fundamentally linked to the good welfare
Resources	Rainwater capture	Rainwater is captured from the roofs of the cattle buildings and diverted into a large underground tank which supplies drinking water for the stock	An estimated annual saving of £2000 (based on the volume of water captured) can be achieved	

Introduction

The UK has approximately 18.7 million hectares of farmland, with about half occupied by cereal crops and the remaining half planted to various types of grassland. There are over 10 million cattle in the UK; 1.8 million dairy cows and 1.6 million beef cows (Source: The June 2009 Agricultural and Horticultural Survey).

The UK's beef and dairy industries have a closely integrated relationship, as calves from the national dairy herd (which are not required as replacements for the dairy industry) provide a crucial source of stock for the beef industry. It is estimated that 50% of the cattle used for beef production are animals sourced from the dairy herd.

Beef is the most commonly eaten red meat in the UK, with around 1.04 million tonnes consumed annually (carcase weight equivalent). It is estimated that the UK is only 75% self-sufficient in beef and 250,000 tonnes of beef are imported each year to compensate for this shortfall.

Upper House Farm, Yockleton near Shrewsbury, England is a calf-rearing and beef-finishing unit, owned by Mr & Mrs Alan Tudor.

"We feel very privileged to be considered as a flagship farm. We like to think that our success is due to using a simple system with emphasis on detail and hygiene with as little physical contact as possible, reducing stress of the stock, but with regular inspections of walking through the pens of stock twice daily."

Louise Tudor, Upper House Farm

The farm covers approximately 400 acres which is used to grow 60 acres of forage maize, 120 acres of winter barley, 120 acres of winter wheat and 60 acres of oil seed rape. In 2008, the farm joined Blade Farming to enable it to develop a more organised and sustainable beef farming operation.

The calf unit is managed by Louise Tudor and has recently been expanded to rear 2,500 calves annually. The calves are all from dairy herds and supplied by Blade Farming in batches of the same breed, sex and age, allowing the unit to work on an "all in, all out" basis.

The calves are reared to 84 days of age on the unit, and are then either transferred to the farm's beef finishing enterprise (400 head per year are finished on farm), or to other Blade beef finishing units.

The two main crops grown to feed to the finishing cattle is forage maize and winter barley, with the cattle manure being used to fertilise the arable land, reducing the need for man-made fertilisers.



Management

The farm is accredited and approved under the Assured British Meat (ABM) scheme for beef. This has been developed to enable the beef industry to meet the ever-increasing demands of consumers and retailers. The scheme has recently been updated and is now aligned with the main English agricultural farm assurance standards. The review ensures that the scheme continues to reflect the emerging requirements of legislation and the marketplace. Participating farmers must abide by a code of practice covering issues such as stockmanship, welfare, nutrition, use of veterinary medicines, animal traceability and environmental controls. Compliance with the scheme is assessed every 18 months by one of the accredited inspection bodies.

*"During 2008 the average differential for Farm Assured and Non Farm Assured stock sold through English livestock markets and reported to the MLC was:
Total cattle (Prime (UTM) Steers, Prime (UTM) Heifers, Young Bulls, Older (OTM) Steers, and Older (OTM) Heifers) 9.24p/kg"*

(EBLEX, Farm assurance price analysis update 2008)

Upper House Farm has been a member of the Blade farming system for two years and has benefitted from Blade's systems and advice. This has allowed the Tudors to manage their time more effectively and efficiently, with their focus being on the care and welfare of the stock and routine operations while management is delegated to the Blade farming staff.

The Tudors are guaranteed a contracted price for rearing every calf, from arrival to 12-weeks of age, and an additional 20% bonus payment if all Key Performance Indicators (KPIs) are met. This financial security has enabled the Tudors to confidently invest in a new purpose-built calf rearing shed. With this facility they are able to rear 2500 calves annually for Blade, with around 400 of these remaining on the farm for finishing.

Another benefit of working with Blade farming is that the Tudors have access to the Blade

Farmworks IT programme. The major benefit of this is the ease in which paperwork associated with cattle movements and medicine administration can be quickly and efficiently maintained without the need for manual data input. By simply scanning the barcode on the animal's passport, the ear tag number, sex, date of birth and breed is automatically completed into the computers movement record – saving a considerable amount of time as there are nearly 4500 cattle movements per year on the farm.

When all the necessary data is inputted into the Farmworks programme the system is able to calculate data for the farm, including daily live weight gain of every animal, cost per kilogram of weight gain, feed conversion efficiency, and a close out report per batch. This information is vital in understanding the profitability of the beef unit. The IT system provided by Blade is being continually improved and ultimately, is designed to help the farm reduce its costs associated with cattle production.



Upper House Farm benefits from economies of scale associated with being part of a larger organisation, while maintaining high economical and ethical standards.

Inputs

Historically a lot of the black and white (Holstein) bull calves produced by the UK's dairy industry were exported to continental Europe for rearing on veal farms. Since the 1996 BSE outbreak, there has been a considerable change in this market, with an export ban, disease outbreaks and pressure from consumer groups, retailers and NGOs who have challenged the ethics of this trade in young calves. This meant the industry had a resource and no market for it, and subsequently led to prices for dairy bull calves dropping to completely uneconomic levels, resulting in tens of thousands of black and white bull calves being humanely culled on farms.

The answer to this issue was not to simply rear these calves in the UK as veal, because changing British eating habits would not be easy (in 2007 only 1% of all beef sales were veal) and marketing UK-reared veal on the continent would be too difficult. The answer lies in the fact that the British beef industry is only 75% self-sufficient and it is anticipated that this new source of beef could make up some of the 250,000 tonnes-a-year shortfall - but only if the economics of production could be considered viable to the farming industry.

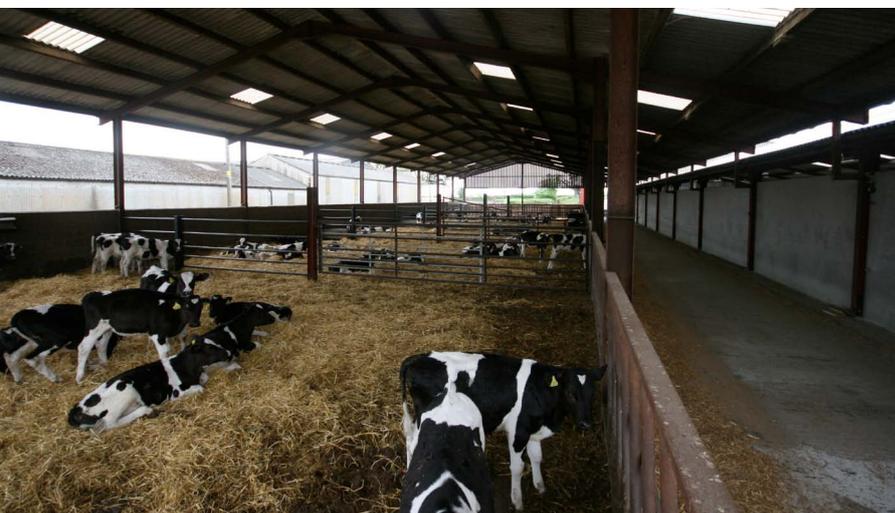
As McDonald's UK purchases around 35,000 tonnes of beef annually, they became an active member of the Beyond Calf Exports Stakeholders Forum (set up in 2006 by CiWF and the RSPCA who convened with the leading

stakeholders in the beef industry to find realistic and economically-viable solutions to rearing a greater number of male dairy calves in the UK). This has led to the links which have been developed between McDonald's and Blade farming.

Blade Farming's approach to this issue has been to use their integrated supply chain to source healthy dairy bull calves and to have these contract-reared on farms which are then paid a guaranteed price for every calf reared to 12 weeks of age. Blade now has links with a leading beef purchaser in McDonald's that are able to buy the forequarter and flank from these animals.

Ultimately, the important issues are that large numbers of dairy bull calves are now being ethically reared at Upper House farm, and in turn, the Tudors are receiving an economic return from this enterprise. This has enabled Blade farming to source and supply a consistent and continuous volume of beef for the McDonald's supply chain.

Once the calves arrive on site they are weighed and divided into social groups of the same size, sex and weight band. The calves are then group housed with good space provision, providing time and labour-saving advantages. Milk is fed through an automatic milk mixing/feeding machine, ensuring milk consistency and constant temperature, resulting in fewer digestive upsets. The group housing also benefits the calves as they are able to facilitate earlier socialisation which can be a benefit in reducing stress associated with changes in feed and environment post-weaning. Once a group is established they are maintained in this stable group, which reduces the stress associated with continual mixing and re-grouping of animals. It can take up to 15 days for a group of cattle to settle after being mixed (Boe and Faerevik, 2003), and this would undoubtedly have an effect on normal behaviour patterns and thus could affect DLWG (Daily Live Weight Gain) and FCR (Food Conversion Ratio). Increased stress levels increases susceptibility to infections and also escalates the shedding of infectious agents in infected animals.



"Various social behaviors and locomotor activity will return to a baseline level within 5 to 15 days following a grouping change such as regrouping or commingling"
(Boe and Faerevik, 2003)

85% of the calves sourced by Blade Farming come directly from the farm of birth. The quality of the calves can be monitored, with farms supplying good quality calves recognised, and vice versa, farms supplying poor quality animals removed as a supplier. The reduction in stress on the calves is also a very important factor as transport times are reduced and time spent away from feed and water is minimised. This ensures that the calves arrive in the best possible condition, a benefit to both their health, and their welfare.



Ethical rearing practices result in reduced stress and improved behaviour, bringing benefits both to animal health and welfare.

Operations

All of the animals, from calves through to the finishing cattle, are bedded on straw. Straw is a comfortable resting substrate that provides a surface compliant to the animal's body and that is thermally comfortable.

"Cattle don't like to lie on hard or wet surfaces but prefer dry, relatively soft locations for resting"

(Irps, 1983; Jensen et al., 1988)

"Straw is a cattle-appropriate resting substrate and should be used whenever possible."

(Krohn and Munksgaard, 1997)

By using plenty of straw all the cattle on the farm are kept clean. This is especially important for the finishing cattle, because it is vital that they are clean when they are slaughtered, to minimise any food safety risk.

Another very important aspect of keeping cattle clean is that dung contamination causes irreparable damage to hides, thus affecting the quality of the finished leather. In 2004 this was estimated to cost the British tanning industry £20 million per annum.

By working closely with their farmers (such as the Tudors), Blade is able to market the hides from its supplies as 'superior' to other hides on the UK market. The majority of damage to hides is caused while the animal is alive. Ultimately the farmer is in control of this quality aspect; however, as they frequently receive no direct financial kickback, there is little motivation for the farmers to invest in this important by-product.

The Blade farming health plan has been developed to ensure that calves are given the best health care, bringing obvious benefits in addition to the improved hide. Firstly all calves are vaccinated against ringworm, a fungal infection which can cause a characteristic shiny or dull circular lesion on finished leather. Ringworm affects 10% of cattle in the UK and results in severe losses to the tanning

industry due to downgrading. Secondly, all calves arriving on the farm are treated for lice and mange. Mange is a skin condition which is associated with irritation and scratching that can cause inflammation, with crusts and scabs forming on the skin. Untreated mange leads to thickening of the skin and potential loss of condition of the animal. It is estimated that 10% of UK cattle are infected with Demodex (*Demodex bovis* is transferred from cow to calf while nursing) and the incidence is increasing.

It may be possible to market the hides from the Blade farming system separately and achieve a bonus payment which could be in the region of an extra £10 per hide above market price; this additional income could then be assigned to the farm and Blade farming.

"In recent years, the standard of European hides and skins has declined, putting increased pressure on the leather industry. Due to higher labour costs and environmental charges, Europe cannot compete with the mass leather production in developing countries. It therefore targets the high value and quality end of the upholstery, leather goods, and shoe trade. In order to maintain this, a supply of good quality raw material is essential. Unfortunately, the availability of quality hides and skins is declining and currently only 30% of all European hides produced achieve the higher grades. This means that 70% of our output is failing to make the grade and represents an estimated loss to the European economy of €800 million per year."

(FAIR Project, Improving Hide and Skin Quality)

Several studies have clearly shown that calf pneumonia is a significant economic drain to a calf rearing enterprise and a significant welfare concern for the affected animals. The costs are not just limited to the expense of treating the condition (estimated at around 40% of the total cost), as other factors such as increased mortality, reduced growth rates, and additional labour requirements all add significantly to the

cost of an outbreak. The approximate cost for every calf treated varies from £40 to £82, and in the UK alone, estimates put the annual cost of Bovine Respiratory Diseases (BRD) in the region of several million pounds.



Good husbandry ultimately results in a better quality product, and the opportunity to sell the bi-product, quality leather hides.

Compared to their size, cattle have relatively small lungs. A large part of the animal's lung capacity is necessary for basal requirements. In the event of a stressful episode or infection, even a small loss of lung function affect the animal's short-term health and more seriously, may ultimately impact on the animal's long-term health. The anatomic and physiological make up of the bovine respiratory system makes it highly sensitive to certain pathogens, which is why pneumonia is such a significant disease of cattle.

Equipped with these facts Blade has developed a health plan which is followed strictly by Upper House farm. The first important step in controlling enzootic pneumonia in young calves is the maintenance of disease resistance. Hence, a strict vaccination policy is followed to cover these common viruses:

BRSV (Bovine Respiratory Syncytial Virus) is a major virus causing respiratory disease in cattle. This is due its common occurrence, and the ability to predispose the respiratory tract to secondary bacterial infection resulting in high mortality rates (from 0-20% of affected animals). BRSV and secondary bacterial infections are difficult to treat; therefore disease control should be aimed at prevention.

Pi3 (Parainfluenza-3 Virus) infections are fairly common in cattle, the virus is generally

associated with subclinical or minor infections, but the relevance of this virus is that it can predispose the animal to develop a secondary bacterial pneumonia.

IBR (Infectious Bovine Rhinotracheitis) is a viral disease which is a highly contagious disease of the upper respiratory tract and can lead to a serious primary infection. Animals are also highly susceptible to secondary bacterial infections.

BVD (Bovine Viral Diarrhoea) is a viral disease of cattle and has been identified as an immunosuppressive agent (an agent that can suppress or prevent the immune response). This can increase the risk of infection such as respiratory disease in calves.

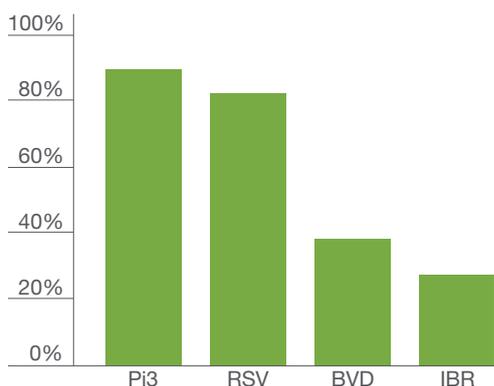
It is very apparent from the viruses listed that they can not only cause severe damage to the respiratory system, which in itself can be deadly, but can also facilitate secondary infections to take hold, which can be far more serious and cause greater damage to the respiratory system. Research shows that only 16% of calves receive a respiratory vaccine in the UK, although all the calves being reared at Upper House farm (and over 16,000 calves annually within the Blade system) are vaccinated.

The viruses listed pose a significant risk to the animals, and trials by Pfizer Animal Health show that over 80% of the calves that were blood tested proved positive to being exposed to Pi3 (Parainfluenza-3 Virus) and BRSV (Bovine Respiratory Syncytial Virus). If other mitigating factors had been present at the same time then secondary infections may have taken hold and serious respiratory disease outbreaks would have occurred with all the associated costs and impacts on long term health.

Pfizer Animal Health offer veterinary practices a subsidised serology scheme for Bovine Respiratory Diseases. This allows vets to take single blood samples from up to 5 calves per farm, and have the samples analysed for antibody levels against BRSV, PI3V, BHV-1 and BVDV. The graph below shows the percentage of calves which have been exposed to the viruses and is therefore a good indication of whether or not these viruses are circulating on the farm.

Percentage of positive blood samples

April 2008 - March 2009 (n=989)



Dairy bred calves

Breakdown of costs: Weight loss 26.4%, Medicines 22.4%, Vet 18.9%, Labour 11.3%, Mortality 7.1%, Materials 7%, other costs 6.8%

Costs	7 unvaccinated herds			1 vaccinated herd (P. multocida detected)
	Lowest cost	Highest cost	Average cost	
Costs per ill calf	£38.83	£78.74	£43.26	£8.59
Cost per calf at risk	£19.42	£47.24	£29.58	£3.58

Suckler calves (mostly weaned 6 month old calves)

Breakdown of costs: Weight loss 40%, Medicines 31.1%, Vet 10.4%, Labour 4.9%, Mortality 14%

Costs	4 unvaccinated herds		
	Lowest cost	Highest cost	Average cost
Costs per ill calf	£59.12	£101.55	£82.10
Cost per calf at risk	£48.55	£101.55	£74.10*

*Cost across the group was not much lower than cost per sick calf because the mortality was very high

Conclusions

In both calf types weight reductions or reduced DLWG during the outbreak were the highest cost.

On average veterinary and medicine fees comprise 40% of the total cost of an outbreak.

Some losses continued after the monitoring period (less in suckler vs. dairy bred)

In all outbreaks vet attention reduced the severity of the disease outbreak and prevented calves deteriorating or dying. On their weekly visits the vets often picked up calves the farmers had missed.

(Cattle Pneumonia Costs, A.H. Andrews; Cattle Practice Vol 8 Part 2 pg 109-114)

The health plan and vaccination policy implemented at Upper House Farm forms the foundation for a healthy animal. The improved health status of the calves ensures that disease outbreaks are minimised and the risk associated with secondary infections is markedly reduced. This is evident in the fact that the Tudors have maintained a mortality rate of below 2% (which includes the dairy bull calves) and that all the key performance indicators (KPIs) set by Blade farming are being achieved (which covers DLWG and FCR, which would be reduced even if sub-clinical pneumonia was present).



Investing in a comprehensive health plan brings both ethical and economic benefits.

"Newly released Government figures show the mortality rates for young calves has improved little over the three year period from 2006 and states the mortality rate for beef calves is 7% and for dairy calves is 14%."

(DEFRA, RADAR)

Another important aspect of the health plan implemented on the farm is that all the calves are dis-budded within four to five weeks of age. A local anaesthetic is used and then the horn bud is removed by the use of a hot iron. As the majority of calves will be sent to other farms for finishing, it is vitally important they do not grow horns as they can cause injuries to other

Excerpt from the FAWC Disbudding and Dehorning Recommendations

Horns are removed from cattle in order to minimise the risk of animals causing injury to each other. Young animals can be disbudded to prevent the growth of horns but once the horns are well established, dehorning is the only option.

Disbudding and dehorning are painful and stressful procedures and effective anaesthesia is essential. A heated disbudding iron applied over the horn buds in young calves aged up to about two months (the age being determined by the size of the horn bud) is much less painful than dehorning, where the horns are cut off with a saw, horn shears or cutting wire and the exposed blood vessels cauterised to prevent haemorrhage. Recent scientific work at Massey University, New Zealand concludes that disbudding with a hot iron is preferable to dehorning.

animals during transport, and horned cattle may have difficulty moving and feeding freely on some finishing farms.

The Tudors have invested in new buildings on their beef unit and these have been designed to maximise the ventilation and air flow whilst not subjecting the calves to draughts and wide temperature variations. This is crucial as cattle are far more sensitive to changes in environmental temperatures than most other farm species. Some of the older buildings on the farm have been converted to house cattle and have been modified to cater for the environmental conditions required for beef housing. Stock numbers in the buildings are also considered important as without the body heat that is created by sufficient numbers of animals inside the building, the stack effect (rising warm air reduces the pressure at the

bottom of the building, drawing cold air in through the sides) will not work effectively and stale air will circulate within the building which can be a possible harbourage for disease.

Through innovative design, the new calf building provides a well-drained bedded lying area, with water troughs being situated close to the drainage system. This avoids saturation in the bedded area, which in turn would increase humidity within the building, and result in the need for extra straw bedding. All the walls within the pens have been treated with a specialist paint which allows pressure cleaning to be undertaken easily and quickly.

EN Investment in innovative building design results in reduced costs, improved environmental conditions in the area and comfortable living conditions for the animals.

EC

ET



Outputs

Due to the investment in a comprehensive and thorough health and vaccination program, the calves have a healthy immune system. Crucially, the feeding regime provides the correct levels of nutrition to achieve target weights gains (which is carefully monitored via the Blade Farmworks IT system in the form of food conversion ratios and daily live weight gains). With the other inputs of the system such as housing and stockmanship, cattle are able to achieve their performance potential in respect of gaining weight as quickly and efficiently as possible, achieving their target finish weights in the designated timescales. This is crucial to ensure that the economics of the enterprise are sufficient to make a sustainable business.

With these economics and efficiencies come benefits from an environmental perspective, especially in respect of reduced methane and CO₂ emissions. One of the biggest impacts of reducing GHG emissions of a beef enterprise is to reduce the time to slaughter. Data supplied by the farm shows that their last batch of continental steers sent for slaughter were 480 days of age and killed out at 324 kilograms deadweight. This compares to an industry average of 692 days to finish at 326 kilograms deadweight. This is a 212 day reduction in days to slaughter (almost 30%), and even taking into account the extra feed required (due to intensification), a large reduction in the GHG emissions of this system can be assumed.

The Tudor farm is also participating in a programme using the world's most sophisticated on-farm greenhouse gas calculator (developed by E-CO₂ and accredited by The Carbon Trust). This is part of a broader project supported by McDonald's whereby in 2009/10 E-CO₂ visited a total of 350 beef farms in the UK and Ireland to assess their carbon emissions. In the second phase of the project, specialist consultants will be working with the farmers to help them bring about reductions through natural farming practices and supply chain efficiencies.



Good agricultural practices ultimately result in reduced GHG emissions.

Resources

When the large finishing shed was being constructed the farm took the opportunity of incorporating a rainwater capture system to provide drinking water for the calves. A 325 cubic metre tank (which was already on the farm) was buried between the finishing and calf sheds prior to resurfacing and concreting the area. By submerging the tank, sunlight is prevented from entering the tank and algal growth in the water is minimised. The water is also protected from adverse weather conditions and will not freeze during the winter months. The main capital investment was in the procurement of a submersible pump which supplies the water to the troughs in the cattle pens, and smaller capital costs were incurred in the laying of pipe work to channel the water from the buildings gutters and for the water pipes from the tank to the water troughs. The economic benefits of this system are clearly evident with mains water currently costing from £0.55 - £1.30 (€0.65 – €1.50) per cubic metre, with further increases predicted for the future. This system will save the farm an estimated £2000 (€2200) (based on a water capture volume of 1200 cubic metres). The other positive benefit is that the areas surrounding the cattle sheds do not become saturated with water, reducing humidity levels and providing a better environment for housed cattle. The size of the collection area and the annual rainfall for the region means the system will collect an estimated 1.2 million litres of water annually. This reduces the amount of water which could be running across fouled yards, or entering dirty water tank/slurry stores, which ultimately would increase the volume of storage required and add to the cost and time of disposal.

"Water is essential for farming but often is taken for granted. Yet in many parts of England and Wales water resources are already scarce and are likely to become even scarcer as a result of climate change."

(Source: Ian Barker, Rainwater Harvesting – an on farm guide by the Environment Agency)



Innovative rainwater capture system reduces costs of water consumption while improving the environment around the building.

“The Tudors operate a very simple and effective system which covers good stockmanship partnered with an established regime of feeding, vaccination, monitoring and recording, which ensures the welfare of the stock whilst maximising their productivity. An excellent example of good practice and attention to detail.”

Karl Williams, Flagship Farms Programme Manager, FAI