EUROGROUP FOR ANIMALS

BRIEFING

ANIMAL WELFARE ASPECTS OF FINISHING BEEF CATTLE IN FEEDLOTS

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Introduction

Eurogroup for Animals is concerned about the definition of "high quality beef" that is used in the Commission's implementing regulation 481/2012 "laying down rules for the management of a tariff quota for high-quality beef."[1] This text defines "high quality beef" as follows:

> *"Beef cuts are obtained from carcasses of heifers and steers (1) less than 30 months of age which* ***have only been fed a diet, for at least the last 100 days before slaughter, containing not less than 62 % of concentrates and/or feed grain*** *coproducts on a dietary dry matter basis, that meets or exceeds a metabolisable energy content greater than 12,26 mega joules per one kilogram of dry matter"*

As this tariff quota has been open to avoid retaliation from the US, the definition of "high quality beef" was written to fit the predominant US model of production. In the US, it is a standard practice to rear beef cattle on pasture for the first phase of their lives and to move calves to feedlots for further fattening. In beef feedlots the proportion of forage in the feed is gradually decreased in favour of grains, eventually reaching ratios that can be as high as 90% of grains.[2]

While we fully support the ban on the use of hormones and beta-agonists as growth-promotants for beef imported into the EU, we dispute the notion that hormone and growth promotant-free beef is *per se* of "high quality." Not only are there numerous animal health and welfare problems associated with feedlot finishing (which we will discuss below), but any claim of "high quality" must be based on superior nutritional and organoleptic characteristics. To the best of our knowledge, there is no evidence that cattle finished in feedlots on a high-grain diet produces beef with such superior qualities. To the contrary, there is some evidence that cattle finished on well-managed pasture and/or silage produces beef with superior characteristics. This could be of interest for EU consumers. For instance, a study made by Steen et al. in 2010[3] concluded :

[1] Commission's implementing regulation 481/2012, 7 June 2012, Annex 2

[2] Shields & Orme-Evans, 2015; quoted by Stevenson, 2015 in "Industrial Livestock Production: The Twin Myths of Efficiency and Necessity"

[3] https://www.tandfonline.com/doi/pdf/10.1080/00288233.2003.9513533

"At an equal rate of carcass gain, animals finished at pasture produced carcasses with a higher lean content (P = 0.03) and a lower fat content (P = 0.03) than those produced from the high-concentrate diet. Muscle from pasture-finished cattle had higher concentrations of omega-3 polyunsaturated fatty acids (PUFA) (141 versus 49 ± 8.2 mg 100 g–1 muscle) and long-chain omega-3 PUFA (58 versus 27 ± 3.8 mg 100 g–1 muscle) than muscle from concentrate-fed cattle. These results highlight the potential of high quality ryegrass pasture for finishing cattle, and meat from pasture-finished cattle as a source of omega-3 PUFA."[4]

While we are aware of the argumentation that a high-concentrate diet to finish beef cattle contributes to mitigating methane emissions, our prime concern remains that there are serious risks to animal health and welfare associated with the practice of both finishing cattle on high-grain diets and keeping them in feedlots. Therefore, we advocate for a re-definition of the "high quality beef" that is allowed to benefit from the tariff quota, which should take into account updated scientific evidence and include alternative cattle rearing systems, which do exist on the US market.

Regarding cattle finished in feedlots, we consider it of special importance to address the following aspects (the list is not exhaustive), which should be measured by using available validated animal and resource-based indicators : expression of normal behaviours; protection from cold and heat stress; availability of clean, dry, comfortable lying areas for all cattle; provision of an adequate proportion of fibre in the diet; regular veterinary inspections and care (e.g., lameness, respiratory diseases, parasites); correct handling.

The various sections below illustrate the main risks associated with practices that are common in the feedlot finishing phase for cattle.

Respiratory diseases

Under dry weather conditions, feedlots can become dusty, which may be detrimental to respiratory health, causing **feedlot dust pneumonia** (Grandin, 2016). The last available USDA data for cattle deaths (for 2010)[5] indicated losses of over one million heads (28% of the total) due to respiratory causes that year. **Respiratory problems are the first cause of cattle death in feedlots** followed by digestive problems, calving, and weather related causes. Exposure to **fine dust** and **endotoxins** from the dried manure present in feedlots, combined with heat stress and metabolic disorders, are predisposing factors for dust pneumonia. They have also been identified as a potential source of occupational respiratory disease for feedlot workers (Anderson et al., 2010).[6] The ammonia released from feedlots contributes to the formation of fine particulate matter (PM 2.5), which is considered a major environmental risk to human health. A study by Hristov (2011)[7] found that :

"Across different regions of the United States and under different weather conditions, PM2.5 formed from ammonia emitted from livestock operations were estimated to contribute on average from 5 to 11% of the

[4] The US livestock industry challenges the superiority of 100% grass-fed, pasture-reared beef stating that meat quality is determined by several factors, including cattle genetics and pasture quality and management.
[5] http://usda.mannlib.cornell.edu/usda/current/CattDeath/CattDeath-05-12-2011.pdf
[6] https://www.cdc.gov/niosh/nioshtic-2/20043494.html
[7] https://www.journalofdairyscience.org/article/S0022-0302(11)00300-6/abstract

*total PM2.5 concentrations. In certain areas (North Central, for example) and in cool weather, farm animal contribution to atmospheric PM2.5 concentration may be as much as 20%."*Respiratory diseases can also be caused by viral and bacterial infections that find fertile grounds if animals are temporarily immunodepressed. Grandin (2016) considers that pre-weaning cattle calves 45 days before they leave the ranch of origin would reduce bovine respiratory diseases (e.g., **Bovine Respiratory Syncytial Virus – BRSV** or **Pasteurella**). However, she also reports that according to one study in the US, up to 40% of the newly arrived cattle were weaned on the day of transport from the ranch of origin to the feedlots. Some authors consider this as a major welfare issue.

Digestive problems linked to high-concentrate diets

After respiratory diseases, grain overload (**acute rumen acidosis**) is one of the major disorders affecting feedlot cattle (Hernandez et al., 2014).[8] The digestive system of cattle is best adapted to roughage provided by grass-based diets. Their natural behaviour is to graze throughout the day. In cattle feeding systems with high ratios of concentrate to forages, digestive problems commonly occur. The starches in concentrated diets are quickly digested and fermentation acids can build up, disrupting the normal function of the rumen. Abnormal rumen function and digestive disorders can lead to acute or **subacute ruminal acidosis** (also known respectively as "grain overload" and SARA), **bloat**, and if persistent, **liver abscesses**, and even foot disorders like **laminitis**.[9] Acute ruminal acidosis is a metabolic status defined by decreased blood pH and bicarbonate. It will appear when animals ingest excessive amount of non-structural carbohydrates with low neutral detergent fibre. Animals will show reduced rumen activity, accumulation of fluids in the rumen, as well as other symptoms such as **diarrhoea** and **dehydration**, liver abscesses, **infections** of the lung, the heart, and/or the kidney, and **neurologic symptoms** due to the toxic effects of blood acidosis on neurons.

In feedlots, warning signs include decrease in chewing activity, weight, and in dry matter intake, as well as an increase in laminitis and diarrhoea prevalence. The prognosis is quite variable. Treatment will be based on the control of systemic acidosis and dehydration (Hernandez et al., 2014).[10] Maintaining normal rumen function on grain-rich feedlot diets is a constant challenge for the industry; **one quarter of cattle mortality in feedlots can be attributed to digestive disorders**. For both acidosis and bloat, increasing the amount of forage in the diet can stimulate chewing and promote saliva production, which have a buffering effect, and thus reduce the likelihood of a sinking pH level and destabilization of the microbial population in the rumen (Shields and Orme-Evans, 2015).[11]

The animal welfare implications of finishing beef cattle in feedlots are recognised by the OIE, which also includes some generic recommendations on the dietary requirements for cattle in its chapter on "Animal welfare in beef cattle production systems"[12] :

[8] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4247954/
[9] https://www.msdvetmanual.com/musculoskeletal-system/lameness-in-cattle/laminitis-in-cattle
[10] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4247954/
[11] http://www.mdpi.com/2076-2615/5/2/361/htm
[12] http://www.oie.int/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_beef_catthe.pdf

"Cattle in intensive production systems typically consume diets that contain a high proportion of grain(s) (corn, milo, barley, grain by-products) and a smaller proportion of roughages (hay, straw, silage, hulls, etc.). Diets with insufficient roughage can contribute to abnormal oral behaviour in finishing cattle, such as tongue rolling. As the proportion of grain increases in the diet, the relative risk of digestive upset in cattle increases. Animal handlers should understand the impact of cattle size and age, weather patterns, diet composition and sudden dietary changes in respect to digestive upsets and their negative consequences (acidosis, bloat, liver abscess, laminitis)."

Potential toxicity of some feed additives used to mitigate methane emissions

Shields and Orme-Evans, 2015[13] stress that some additives that are being currently tested to reduce methane emissions from ruminants raise potential animal welfare concerns :

"*One such additive tested in vitro is **fumarate**, but feeding fumarate in its free acid form can lower rumen pH and inhibit fibre digestion, while feeding it in salt form can induce toxicity. **Nitrates** are also potential methane mitigation agents, especially in low protein diets. However, nitrite, an intermediate product of nitrate metabolism, is toxic. Feeding it requires thus a gradual acclimation to a high dietary intake in order to avoid nitrite toxicity. Another proposed supplement, **sulphate**, has been linked to the occurrence of polioencephalomalacia*[14] (brain inflammation and necrosis)*, a condition associated in US feedlot cattle with excessive production of H_2S* (hydrogen sulphide) *in the rumen from diets high in distillers grains, a co-product from the ethanol industry that is high in sulphate. The FAO cautions that more research is needed. Mitigation strategies should steer clear of feeding substances that might endanger the animals, either outright or in the absence of highly skilled management".*

Other major animal welfare issues associated with feedlot finishing

Dr Temple Grandin analysed some of the major non-digestive challenges associated with finishing cattle in feedlots, giving also some concrete proposals on how to mitigate them (Grandin, 2016).[15] Her conclusion is that risks for animal welfare can be mitigated at least partially with better management and consistent monitoring of animal-based indicators. This is also a point of view reflected in several recommendations made by the European Food Safety Authority (EFSA) and the European Commission as regards farm animal welfare. Such an approach would imply auditing and/or certification mechanisms. The problems identified by Dr Grandin (and others) are presented below.

Presence of mud

Feedlots located in areas with high annual rainfall can have serious issues with **mud**. According to Dr Grandin, controlling mud in outdoor feedlots becomes increasingly difficult if annual rainfall is higher than 51 cm. Presence of mud not only **makes it difficult for cattle to move and to rest** (as they prefer to lie on dry surfaces), but it also **compromises hygiene**. More than half of cattle finished in muddy feedlots arrive dirty

[13] http://www.mdpi.com/2076-2615/5/2/361/htm
[14] http://ag.ansc.purdue.edu/sheep/ansc442/Semprojs/2002/neurological/polio.htm
[15] https://www.sciencedirect.com/science/article/pii/S2451943X16300278

at slaughter, most frequently dirty or manure-soiled in the abdominal regions and on the flanks (Grandin, 2016).

Heat and cold stress

In her 2016 study, Dr Grandin states:

"In the US heat waves have had a significant detrimental effect on beef cattle welfare. On average 5000 head of cattle are lost each year due to heat stress [...]. Heat stress losses are most likely to occur with a combination of high temperatures, high humidity, and low air movement [...]. There are three basic factors that may contribute to heat stress problems in an outdoor feedlot. They are the ***lack of shade****,* ***heavy cattle weights****, or* ***cattle with black hides****. Black cattle get significantly hotter on the surface of their hides than lighter colored cattle. Compared to twenty years ago, cattle are being fed to heavier weights. Heavier animals have a more difficult time cooling themselves. The diet fed to the cattle can also have an effect on heat stress."*

With regards to heat stress, it is essential to provide shade to the animals and to adapt water availability to the increased water requirements in the summer (Grandin, 2016). Continuous access to clean drinking water is an important part of the Welfare Quality (2009) assessment for fattening cattle[16]..

From what has been described so far, it is already clear that several of the health and welfare problems that are linked to feedlot-finished cattle are inter-related: the high-grain diet determines digestive and metabolic disorders, which are *per se* potentially fatal; this diet is formulated to make animals put on weight faster, and in doing so it makes them heavier, compromising their ability to thermoregulate; together with potential adverse weather conditions and with dust or mud in the feedlots, this can predispose the animals to very serious health and welfare problems.

Not only heat but also cold stress can be a problem for cattle confined to feedlots. According to Dr Grandin (2016),[17] **extreme cold weather events in the high plains area of the US can cause large death losses**, especially if associated to the presence of mud, which will also increase the animals' energy requirements. Serious welfare issues can occur if cattle with thin summer hair coats are moved to cold snowy areas. The length of the haircoat determines the animal's critical temperature.

Transport

Shields and Orme-Evans (2015)[18] list a number of issues associated with the transport of finishing calves to feedlots:

"Finishing calves in a feedlot usually involves transporting them from their natal pastures. In the United States, nearly two-thirds (63%) of cattle and calves raised for beef are sold through an auction barn after leaving the farm, thus, many calves are moved twice before arrival at a feedlot. ***Transport*** *takes a physical and psychological toll on animals. Stressors include unfamiliar surroundings, novelty, noise, vibration, social*

[16] http://www.welfarequalitynetwork.net/media/1088/cattle_protocol_without_veal_calves.pdf
[17] https://www.sciencedirect.com/science/article/pii/S2451943X16300278

[18] http://www.mdpi.com/2076-2615/5/2/361/htm

regrouping, loading and unloading, and feed and water deprivation, although many factors, such as preconditioning and location in the vehicle during the journey can alter the effect. The stress of transport can lead to ***immunosuppression*** *and an increase in disease susceptibility, including the ubiquitous* ***Bovine Respiratory Disease (BRD)*** *problem."*

Rough handling

Grandin (2016) reports the results of a survey of cattle handling at 30 California cow calf ranches showing that there was **excessive use of electric prods,** which **i**s associated with cattle balking, falling down, and vocalization. Excessive use of electric prods is just one example of stressful and painful handling that should be addressed and minimised (such uses during loading and unloading operations of livestock for transport are, for instance, strictly regulated in Europe).

Mitigating animal welfare challenges in feedlots

Temple Grandin (2016) recommends that numerical scoring of **animal based indicators** should be consistently used to assess animal welfare in feedlot cattle. The suggested minimal set of indicators is: (1) **panting** scoring for feedlots in hot climates to measure heat stress, (2) **cleanliness** of the skin and legs to assess muddy conditions, and (3) numerical scoring of **cattle handling** practices. If we look at the specific Welfare Quality (2009)[19] protocol for cattle, there are many more relevant animal-based indicators that can and should be measured. These should be integrated with the assessment of **resource-based measures**, including but not limited to continuous and sufficient access to clean water, fibre in the diet, presence of shade (natural or man-made) or shelters to mitigate the effects of extreme weather conditions, and standards for veterinary care.

Our recommendations to the European Commission

Our main suggestions for the European Commission in the next phase of the negotiations with the US are as follows:

- To propose a redefinition of "high quality beef" that is expanded to include cattle that is not finished in feedlots and/or on a high grain diet, and namely:
    - Pasture-reared 100% grass-fed beef cattle, see for instance the label **American Grassfed**[20] or **Certified Grassfed**[21] (AGV- A Greener World)
    - Pasture-reared beef cattle (with grain supplementation allowed) - see for instance labels like **GAP Step 4, 5 and 5+**[22]

[19] http://www.welfarequalitynetwork.net/media/1088/cattle_protocol_without_veal_calves.pdf
[20] **https://www.americangrassfed.org/**
[21] https://agreenerworld.org/certifications/certified-grass-fed/
[22] https://globalanimalpartnership.org/wp-content/uploads/2017/06/5-Step%C2%AE-Animal-Welfare-Rating-Standards-for-Beef-Cattle-v1.0.pdf

- Cattle reared in other systems not permitting feedlots and with permanent access to pasture, whose nutrition is high in rough fibre/forage - see for instance the requirements for the label **Animal Welfare Approved**[23] (AGV-A Greener World)

- To discuss the possibility to reserve a proportion of this" high quality beef" tariff rate quota to 100% grass-fed pasture-based beef, pasture-reared beef, and cattle reared in alternative non-feedlot systems, with a view to allow alternative and certified cattle producers to access the EU market under this preferential quota, considering that grass-fed beef may have superior nutritional qualities compared to grain-finished beef

- To work together with the US to improve standards for feedlot-finished cattle destined to be exported to the EU as "high quality" beef so that conditions satisfy at least the requirements of the **Certified Humane** (a program of Humane Farm Animal Care)[24] label or the **GAP standards for cattle Step 2.**[25]

Examples of US private standards for beef cattle

The following is a non-exhaustive list of US labels for beef cattle that the Commission may want to consider as examples of what exists in the US. Eurogroup for Animals has not analysed the standards in any detail and does not endorse any of them in particular. However, they have been identified as "meaningful third party certifications" by Compassion in World Farming USA and US consumer organisations. We therefore consider important for the Commission to be aware of their existence. Some aspects that are included in those standards may offer concrete opportunities to better frame the discussion around the welfare of beef cattle in alternative systems that are already present in the US, and to recognise the importance of such alternative systems.

Note*: the non-therapeutic use of antibiotics, growth hormones, and beta agonists is prohibited under all these schemes*

American Grassfed [26]

Main principles :

- Diet — Animals are fed only grass and forage from weaning until slaughter.
- Confinement — Animals are raised on pasture without confinement to feedlots.
- Antibiotics and hormones — Animals are never treated with antibiotics or growth hormones.
- Origin — All animals are born and raised on American family farms.

[23] https://agreenerworld.org/certifications/animal-welfare-approved/standards/beef-cattle-and-calves-standards/#6-food-and-water-
[24] https://certifiedhumane.org/wp-content/uploads/Std14.BeefCattle.3M-1.pdf
[25] American Humane Certified (http://www.humaneheartland.org/our-farm-programs/american-humane-certified) also has standards for beef cattle, although this certification system has been recently under scrutiny by animal rights organisations in the US for allegedly failing to ensure improved animal welfre standards in practice.
[26] https://www.americangrassfed.org/

Detail cattle standard**s** can be found here and the list of producers here.

A Greener World "Animal Welfare Approved" [27]

According to the website, "*certified Animal Welfare Approved by AGW is the only label that guarantees animals are raised outdoors on pasture or range for their entire lives on an independent farm using truly sustainable, high-welfare farming practices. It is the only label in the U.S. to require audited, high-welfare production, transport and slaughter practices, and has the single highest impact on consumer purchasing of any food label, according to The Hartman Group".* "Animal Welfare Approved" standards for beef cattle can be found here.

A Greener World "Certified Grassfed" [28]

According to the website, "a*n optional, additional accreditation to Certified Animal Welfare Approved by AGW, Certified Grassfed by AGW is the only certification and logo in the U.S. and Canada that guarantees food products come from animals fed a 100 % grass and forage diet, raised outdoors on pasture or range and managed according to the highest welfare and environmental standards on an independent farm."* "Certified Grassfed" requirements can be found here.

Global Animal Partnership standards (GAP 5-step program) [29]

- Cattle standards can be found here.
- Farms certified according to Steps 4, 5, and 5+ must keep animals permanently on pasture, with or without supplementation with grains in the diet.
- A list of adhering farms is available on the website of GAP.

Certified Humane (a program of Humane Farm Animal Care) [30]

The Stated mission of Certified Humane is the following : "*Humane Farm Animal Care (HFAC) is the leading non-profit certification organization dedicated to improving the lives of farm animals in food production from birth through slaughter. The goal of the program is to improve the lives of farm animals by driving consumer demand for kinder and more responsible farm animal practices. When you see the Certified Humane Raised and Handled® label on a product you can be assured that the food products have come from facilities that meet precise, objective standards for farm animal treatment."*

Their Beef cattle standard can be found here.

[27] https://agreenerworld.org/
[28] https://agreenerworld.org/
[29] https://globalanimalpartnership.org/
[30] https://certifiedhumane.org/