


**Animal Welfare & Beef
Industry Practices:**
Dehorning, Castration, & Branding

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My Goal for Today is...

NOT to defend animal welfare-based groups
or activists

NOT to question industry practices

TO educate industry participants on animal
welfare-related issues related to beef
cattle, and science driving their evaluation

Societal Concerns

Reality of Societal Concerns

1. Society and beef consumers are becoming increasingly aware of animal welfare concerns
2. There are several on-farm and on-ranch husbandry procedures under scrutiny
3. Some European countries mandate the use of analgesia with surgical procedures (e.g. castration) older than 2 months of age

Rollin (2004), HSUS (2011), MAFF (1992)

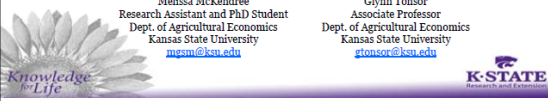
Risk and Profit 2014

Do you know your consumer?

Similarities and differences in consumer and producer views of animal welfare in the beef industry

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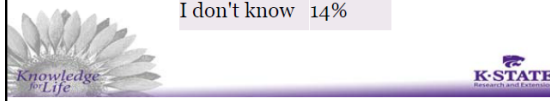


http://www.agmanager.info/events/risk_profit/2014/Papers/8_McKendree-Tonsor_AnimalWelfare.pdf

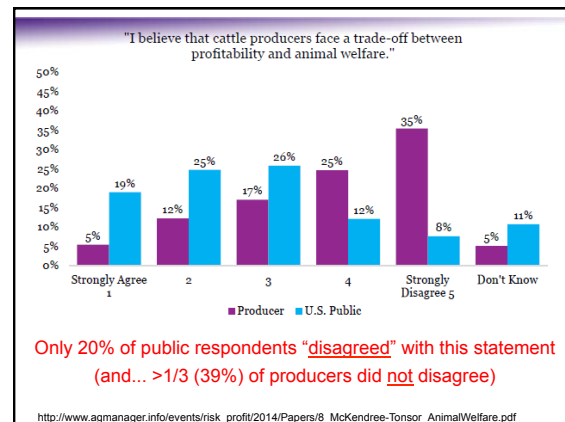
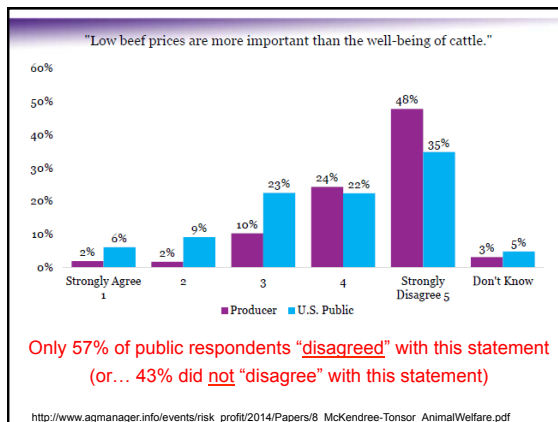
We asked the U.S. Public...

Are you concerned about the welfare of beef cattle in the United States?

Yes	65%
No	21%
I don't know	14%



http://www.agmanager.info/events/risk_profit/2014/Papers/8_McKendree-Tonsor_AnimalWelfare.pdf



Welfare Views Among Industry and Activist Groups

An inward look: 8 Areas of Welfare Concerns

Beef checkoff-funded white paper...

"Beef cattle welfare in the US: Identification of key gaps in knowledge and priorities for further research"

Tucker et al., 2013

Tucker et al., 2013 (fact sheet)

8 Areas of Welfare Concern

- 1. Nutrition and growth**
 - Abrupt weaning
 - Disease due to high concentrate diets
 - Sub-acute rumen acidosis (SARA)
 - Liver abscesses
 - Borderline body condition score (BCS) in winter
 - Production technologies
 - Antibiotics / Ionophores
 - Hormonal implants
 - Beta agonists
- 2. Health – Lameness, respiratory (BRD) ?**

Tucker et al., 2013 (fact sheet)

8 Welfare Concerns (cont'd)

- 3. Painful procedures (& no pain mitigation)**
 - Castration
 - Dehorning
 - Branding
- 4. Winter weather**
 - Muddy and wet conditions
- 5. Heat load**
 - Use of shade or water to alleviate heat stress

Tucker et al., 2013 (fact sheet)

8 Welfare Concerns (cont'd)

6. Social interaction

Co-mingling of cattle (& use of auction market)

Health / stress

Buller steer syndrome (2-4% incidence)

High stocking density & aggression

7. Transport

Space, feed / water withdrawal, weather

Distance hauled, rest intervals, unloading

8. Slaughter (...not really an issue)

Kill method vs. pain / sensibility

Tucker et al., 2013 (fact sheet)

Activist Group Views (HSUS)



THE HUMANE SOCIETY
OF THE UNITED STATES

An HSUS Report: The Welfare of Calves in the Beef Industry

Abstract

Calves raised for beef begin life unconfined, on rangeland where they are free to express their natural behavior. However, the welfare of calves can be compromised by certain specific management practices, typical on many ranching operations. These include castration of male calves, dehorning, and branding, all of which are usually performed without anesthesia or analgesia, pain relief of any kind. Welfare is also a concern during weaning, handling, auction, and transport, common stressful events that occur before calves are moved to feedlots. Techniques to minimize pain and distress should be used or further developed in order to address the customary practices in beef production that reduce the welfare of these young animals.

http://www.humanesociety.org/assets/pdfs/farm/welfare_calves.pdf

“While many other commercially produced animals used in agriculture, such as pigs and chickens, are raised in indoor confinement facilities, **young calves in the beef industry** are largely permitted to roam outdoors, which in comparison, is a **substantial welfare improvement.**”

-- HSUS Report: The welfare of calves in the beef industry

5 Major HSUS Concerns

1. Abrupt weaning (vs. “low-stress” or natural)

2. Calf transport (distance, space)

“Painful” procedures:

3. Castration

4. Horn bud / horn removal vs. polled gene

5. Branding

“Painful and stressful events, especially when experienced

painful “mutilations”

branding are serious issues that must be addressed.”

-- HSUS Report: The welfare of calves in the beef industry

Concerns w/ “Painful” Practices

Is it done? (yes / no)

What method is used?

Castration: knife cut, band, burdizzo

Branding: hot iron, freeze

Dehorning: paste, tipping, scoop

Is pain mitigation used?

anesthesia (local / gen)

analgesia (pain mgmnt)

Age of animal?



Pain Relief in Beef Cattle

Challenges with Pain Relief

Currently, there are no drugs approved by the U.S. Food and Drug Administration (FDA) for pain relief in beef cattle:

Flunixin meglumine

Non-steroidal anti-inflammatory (NSAID)

Intravenous (iv) administration

Fever (w/ BRD), endotoxemia, acute mastitis

“Extra-label drug use “ (ELDU)

Not “legal” by anyone (veterinarians included)

Animal Medicinal Drug Use Clarification Act (AMDUCA) exception...

American Medicinal Drug Use Clarification Act (AMDUCA) of 1994

ELDU can be used to relieve suffering given specific conditions are met:

- Only by or under veterinarian supervision
- Only FDA approved animal & human drugs
- Only permitted when health of the animal is threatened (not for production purposes)
- Not in feed
- Not if it results in a violative drug residue in food intended for human consumption

(AMDUCA, 1994; Wren, 2011)

Challenges with Pain Relief

Currently, there are no drugs approved by the U.S. Food and Drug Administration (FDA) for pain relief in beef cattle:

Delay from drug administration to procedure

Longer processing times (veterinary time cost)

Meloxicam

- Oxicam class NSAID approved for food animal use in the EU and Canada

- Half-life of 27.5 hrs in Holstein calves (Coetzee et al., 2008)



Which of the following actions/practices are currently implemented on your operation?

Actions/Practice	Freq. out of 686	Percent (think of as lower bound)
Handlers strive to move cattle at a comfortable pace, refrain from using loud noises, and use an electric prod on less than 10% of cattle. Sticks and flags can be used as extensions of the handler's arm but must not be used to hit cattle.	493	72%
Restrict use of antibiotics to only disease treatment	454	66%
Develop a herd health plan with the help of a veterinarian.	398	58%
★ Castrate male calves either within the first three months of age or with pain control.	376	55%
Consistent training program for owner and employees focusing on principles of animal care and handling.	269	39%
★ Dehorn (remove horns)/disbud calves either before horn tissue adheres to skull or with pain control.	224	33%
★ Third party verification that appropriate animal care and facilities are provided on farm.	64	9%
None	10	1%

http://www.agmanager.info/events/risk_profit/2014/Papers/8_McKendree-Tonsor_AnimalWelfare.pdf

Regulation and Market Drivers

Welfare Regulation History

1958 Humane Slaughter Act

First regulation to oversee cattle handling
Focused on killing method

Humane Methods of Slaughter Act of 1978

Follow-up to address handling concerns

Enforced by USDA-FSIS vets / inspectors:

- Unloading trucks
- Condition of facilities
- Animal handling in alleys
- Non-ambulatory cattle
- Access to water / feed
- Stunning procedures

Regulation History (cont'd)

"Recommended Animal Handling Guidelines for Meat Packers" – Grandin (1991)

American Meat Institute (AMI)
Voluntary

"Good Management Practices (GMP) for Animal Handling/Stunning" – Grandin (97)

Self-audits of animal well-being

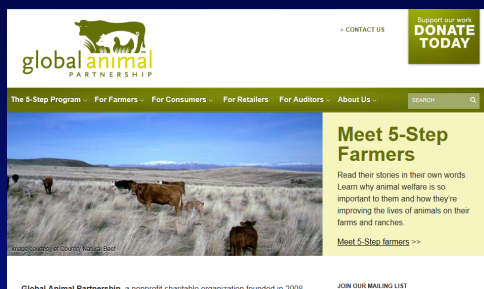
Stunning / handling survey ('96) - USDA funded

Welfare audits by fast-food retailers (late '90s)

Who's Driving This Issue Now?

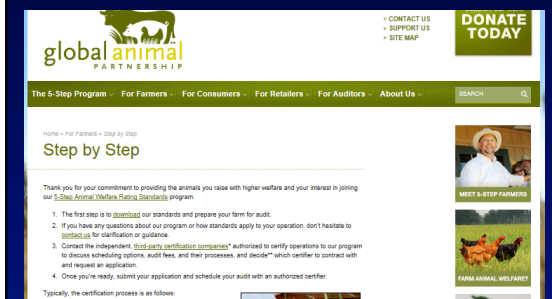


Whole Foods and Global Animal Partnership (GAP)



<http://www.globalanimalpartnership.org/>

GAP's 5 "Steps"



<http://www.globalanimalpartnership.org/>

Our Standards

We invite farmers, retailers, consumers, and all others interested in learning more about our 5-Step program to download our multi-tiered standards currently in place.

Beef Cattle

- Standards
- Application

Chickens Raised for Meat

- Standards
- Application

Pigs

- Standards
- Application

NEW: 5-Step Animal Welfare Rating Standards for Pigs v2.0 (this revised set of standards will go into effect 5 June 2015)

NEW: Application for 5-Step Animal Welfare Rating Standards for Pigs v2.0 (this new application accompanies the revised set of standards and will go into effect 5 June 2015)

Turkeys

- Standards
- Application

"The GAP 5-Step program is all about honesty, integrity and attention to detail. We are very proud to be a part of the first legitimate animal welfare certification program."

—Scott Sechler, Bell & Evans

<http://www.globalanimalpartnership.org>

5-STEP ANIMAL WELFARE RATING

YOUR WAY OF KNOWING HOW OUR MEAT ANIMALS ARE RAISED

GLOBAL ANIMAL PARTNERSHIP™

Founded in 2008, Global Animal Partnership is an international, multi-stakeholder organization dedicated to continually improving the lives of farm animals through multi-faceted outreach, training and the development and implementation of the 5-Step Animal Welfare Rating system.

WHAT IS THE 5-STEP ANIMAL WELFARE RATING PROGRAM?

Global Animal Partnership's tiered rating system was developed to rank animal welfare practices and conditions within farm animal production systems. The ratings are determined by independent third-party certifiers using auditors trained by Global Animal Partnership. These auditors use specific criteria to evaluate animal health and well-being, handling, living conditions and transportation.

THE 5-STEP ANIMAL WELFARE RATING PROGRAM AT WHOLE FOODS MARKET®

Throughout our meat department you'll find chicken, beef and pork labeled with the Global Animal Partnership 5 Step Animal Welfare Rating. It's your way of knowing exactly how the animals were raised for the meat you are buying. We have made it easier for you to identify the steps with simple color coding. You will not find any chicken, beef or pork with a red label in Whole Foods Market meat cases.

THE STEPS:

ANIMAL WELFARE RATING: 5+ ANIMAL CENTERED, ENTIRE LIFE ON SAME FARM

ANIMAL WELFARE RATING: 5 ANIMAL CENTERED, NO PHYSICAL ALTERATIONS

ANIMAL WELFARE RATING: 4 PASTURE CENTERED

ANIMAL WELFARE RATING: 3 ENHANCED OUTDOOR ACCESS

ANIMAL WELFARE RATING: 2 ENRICHED ENVIRONMENT

ANIMAL WELFARE RATING: 1 NO CAGES, NO CRATES, NO CROWDING

NOT STEP RATED: DOES NOT MEET WHOLE FOODS MARKET REQUIREMENTS

RED	ORANGE	ORANGE PLUS	YELLOW	GREEN	GREEN PLUS
Does Not Meet Whole Foods Market Requirements	Global Animal Partnership Step 2	Global Animal Partnership Step 3	Global Animal Partnership Step 4	Global Animal Partnership Step 5	Global Animal Partnership Step 5+
No Crowding	Enriched Environment			Pasture Centered	
		Chickens must be provided for expressing and scratching (natural behavior). *		Pasture/range provides environment for expression of natural behavior. *	Pasture/range provides environment for expression of natural behavior. *
	At least 50% vegetative cover on range/pasture.	At least 75% vegetative cover on range/pasture.		At least 75% vegetative cover on range/pasture.	At least 75% vegetative cover on range/pasture. *
	At least 1/3 of life on range/pasture.	At least 1/3 of life on range/pasture.		At least 1/3 of life on range/pasture.	Entire life on range or pasture. *
	Maximum castration age 3 months using approved method for Steps 2-4.	Maximum castration age 3 months using approved method for Steps 2-4.		Maximum castration age 3 months using approved method for Steps 2-4.	Castration prohibited. *
	De-horning and routine horn tipping are prohibited.	De-horning and routine horn tipping are prohibited.		De-horning and routine horn tipping are prohibited.	De-horning, routine horn tipping and disbudding are prohibited. *
	Minimum weaning age of 6 months.	Minimum weaning age of 6 months.		Minimum weaning age of 6 months.	Minimum weaning age of 6 months. (Step 5) *
	Maximum 25-hour transport.	Maximum 16-hour transport. *		Maximum 16-hour transport.	Maximum 8-hour transport (Step 5). *
	No market animals purchased from other sources than:	No market animals purchased from other sources than:		No market animals purchased from other sources than:	No market animals purchased or sold through sale to another farm. *
	Building required in all housing.	Building required in all housing.		Building required in all housing.	Building required in all housing.
	Space in housing for cattle to exercise, to rest and other body without restriction.	Space in housing for cattle to exercise, to rest and other body without restriction.		Space in housing for cattle to exercise, to rest and other body without restriction.	Space in housing for cattle to exercise, to rest and other body without restriction.
	Electric shock prohibited except in case of imminent danger to animal or handler.	Electric shock prohibited except in case of imminent danger to animal or handler.		Electric shock prohibited except in case of imminent danger to animal or handler.	Electric shock prohibited except in case of imminent danger to animal or handler.
	No antibiotics, added growth hormones or animal by products.	No antibiotics, added growth hormones or animal by products.		No antibiotics, added growth hormones or animal by products.	No antibiotics, added growth hormones or animal by products.
	Calf only moved to another range/pasture with welfare.	Calf only moved to another range/pasture with welfare.		Calf only moved to another range/pasture with welfare.	Calf only moved to another range/pasture with welfare.
	All animals must be processed from here or cold store and then frozen on-site.	All animals must be processed from here or cold store and then frozen on-site.		All animals must be processed from here or cold store and then frozen on-site.	All animals must be processed from here or cold store and then frozen on-site.
	Independent 3rd party audits of farm, transport and slaughter/processing plans.	Independent 3rd party audits of farm, transport and slaughter/processing plans.		Independent 3rd party audits of farm, transport and slaughter/processing plans.	Independent 3rd party audits of farm, transport and slaughter/processing plans.

ORANGE PLUS Global Animal Partnership Step 2	GREEN Global Animal Partnership Step 4	GREEN PLUS Global Animal Partnership Step 5+
Enriched Environment	Pasture Centered	Step 5: ANIMAL CENTERED, NO PHYSICAL ALTERATIONS Step 5+: ANIMAL CENTERED, ENTIRE LIFE ON SAME FARM
		On farm or local slaughter (Step 5+). *
		Branding and ear notching are prohibited. *
Objects must be provided for grooming and scratching (natural behavior). *	Pasture/range provides environment for expression of natural behavior. *	Pasture/range provides environment for expression of natural behavior.
At least 50% vegetative cover on range/pasture.	At least 50% vegetative cover on range/pasture.	At least 75% vegetative cover on range/pasture. *
At least 1/3 of life on range/pasture.	At least 1/3 of life on range/pasture. *	Entire life on range or pasture. *
Maximum castration age 3 months using approved method for Steps 2-4. *	Maximum castration age 3 months using approved method for Steps 2-4.	Castration prohibited. *
De-horning and routine horn tipping are prohibited.	De-horning and routine horn tipping are prohibited.	De-horning, routine horn tipping and disbudding are prohibited. *
Minimum weaning age of 6 months.	Minimum weaning age of 6 months.	Minimum weaning age of 8 months. (Step 5). *
Maximum 16-hour transport. *	Maximum 16-hour transport.	Maximum 8-hour transport (Step 5). *



What are “standards” (GAP or otherwise) based on?

Determining “Well-Being”

Historically measured via:

Animal performance (aka productivity)

Average daily gain

Feed intake

Feed efficiency (gain:feed ratio)

Health status

Criticism by consumers

Performance doesn't necessarily reflect or
guarantee good welfare

Hard to Measure Pain

Challenges

Confounded by animal handling on:

Cortisol

Heart rate, respiration rate

Subjective evaluation:

Poor accuracy

Poor consistency within observer

Research opportunity?

Objective evaluation of attempted “escape
behaviors”

Can We Measure “Behavior”?



Determining “Well-Being”

Newer methods:

Objective

Behavior associated with chute (exit velocity)

Exit Velocity



Determining “Well-Being”

Newer methods:

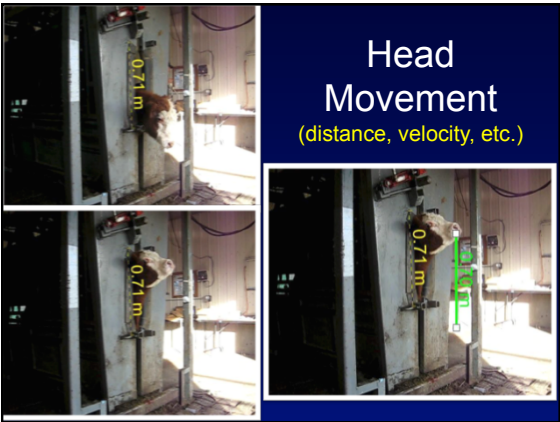
Objective

Behavior associated with chute (exit velocity)

Video-based evaluations (kicking, ear flicks, etc.)

Head Movement

(distance, velocity, etc.)



Determining “Well-Being”

Newer methods:

Objective

Behavior associated with chute (exit velocity)

Video-based evaluations (kicking, ear flicks, etc.)

Subjective

Behavior associated with chute (chute score)

Chute Score

Order	ID	Calm	Restless	Nervous	Flighty	Aggressive	Comments
1							

Determining “Well-Being”

Newer methods:

Objective

Behavior associated with chute (exit velocity)

Video-based evaluations (kicking, ear flicks, etc.)

Subjective

Behavior associated with chute (chute score)

In-pen behaviors

Meal size, meal duration, individual intake, etc.

Behavior of animals in pen (lying, standing, etc.)

Branding research in beef cattle



Comparison of Image Analysis, Exertion Force, and Behavior Measurements for Use in the Assessment of Beef Cattle Responses to Hot-Iron and Freeze Branding¹

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Departments of ¹Herd Medicine and Theriogenology, ²Agriculture and Bioresource Engineering, and ³Computer Science, Computer Vision Laboratory, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 5B4

ABSTRACT: Thirty-three steers (328 ± 2 kg) from a total of 300 animals were randomly selected for a comparison of techniques designed to quantify the behavioral response to painful procedures. The steers were randomly assigned to freeze-branding (F), hot-iron branding (H), and sham branding (S) treatments. The responses of all steers were videotaped to quantify the amount and intensity of head movements during branding. In addition, the force that steers exerted on the headgate and squeeze chute during branding was recorded using strain gauges and load cells. Behaviors believed to be indicative of pain (tail-flicking, kicking, falling, and vocalizing) were also recorded during branding. These techniques were compared for their effectiveness in measuring behavioral responses of steers during branding. Hot-iron-branded steers had greater maximum and average head movement distances and velocities than F or S steers ($P < .05$), and F steers only had greater maximum values than S animals ($P < .05$). The maximum exertion forces obtained from headgate load cells were also greater in H than in F or S steers ($P < .05$); however, no differences were observed between H and F treatments for squeeze load cell or headgate strain gauge data. Hot-iron-branded steers had the greatest incidence of tail-flicks, kicks, falls in the chute, and vocalizations, and S steers had the least. Results indicate that H steers experienced more discomfort at the time of branding than F and S steers, whereas F steers experienced more discomfort than shams. Image analysis was a superior technique for detecting treatment differences compared with exertion force measurements and frequency counts of tail-flicks, kicks, falls, and vocalization during branding.

Key Words: Behavior, Branding, Cattle, Pain, Image Processing

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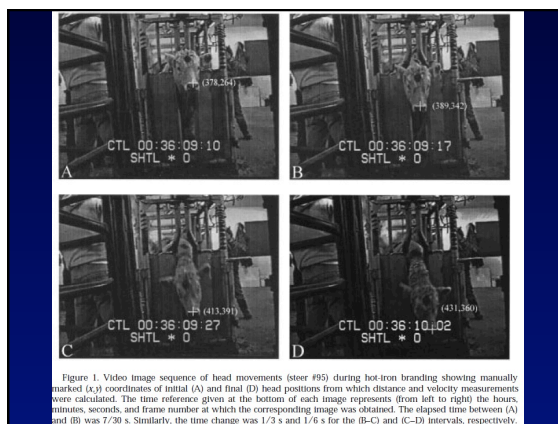
Canadian Branding Study

N = 33 steers, 328 kg
Hot iron (H), freeze (F), and sham (S) branding
Video documentation

- Tail flicking
- Kicking
- Falling
- Vocalization

Measurements:

- Strain gauge and load cells
- Force against head-gate (x 2) and on squeeze chute



Branding Study Results

- Maximum and average head movement
Hot > Freeze > Sham
- Maximum exertion force headgate load
Hot > Freeze = Sham
- Headgate strain and squeeze load
Hot = Freeze = Sham
- Tail flicks, kicks, falling, vocalization (no.)
Hot greatest, Sham least

Overall Conclusions

- Society is becoming increasingly concerned with methods used to produce beef.
- Options are available for consumers to purchase welfare-verified beef at retail.
- Standards are not yet science-based, and data are hard to generate. The beef industry should probably take the lead on this.
- Data suggest several procedures are painful.
- No drugs are available for pain mitigation.

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