Dairy herd welfare
– a must for the cow, the farmer, and the consumer

JENNIFER VAN OS
Outline

➢ Who am I? How did I get here? What is my goal?

➢ What is animal welfare science?

➢ How do different stakeholders view animal welfare?

➢ What are some of the current and future considerations and priorities for dairy cattle welfare?
Outline

- Who am I? How did I get here? What is my goal?

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Animal-lover with little knowledge about food animal production
Animal-lover with little knowledge about food animal production
2008 California ballot proposition

**Prop 2**

STANDARDS FOR CONFINING FARM ANIMALS.
INITIATIVE STATUTE.

**SUMMARY**

Put on the Ballot by Petition Signatures

Requires that certain farm animals be allowed, for the majority of every day, to fully extend their limbs or wings, lie down, stand up and turn around. Limited exceptions apply. Fiscal Impact: Potential unknown decrease in state and local tax revenues from farm businesses, possibly in the range of several million dollars annually. Potential minor local and state enforcement and prosecution costs, partly offset by increased fine revenue.
2008 California ballot proposition

ARGUMENTS

PRO  YES on Prop. 2 protects animals, consumers, family farmers, and our environment. Animals deserve humane treatment. Denying them space to turn around or stretch their limbs is cruel and wrong. Supporters: Humane Society of the United States, California Veterinary Medical Association, Consumer Federation of America, Center for Food Safety. www.YesOnProp2.org.
ARGUMENTS

PRO  

YES on Prop. 2 protects animals, consumers, family farmers, and our environment. Animals deserve humane treatment. Denying them space to turn around or stretch their limbs is cruel and wrong. Supporters: Humane Society of the United States, California Veterinary Medical Association, Consumer Federation of America, Center for Food Safety. www.YesOnProp2.org.

Animal Rights
We should not invariably overrule animal interests for human interests.
We should not inflict pain or death on animals.
We should always treat animals humanely.
We should abolish animal use.
Using animals to benefit ourselves is morally wrong.
Example organisations: PETA. HSUS.

Animal Welfare
We should invariably overrule animal interests for human interests.
We should not cause animals 'unnecessary' pain or death.
We should treat animals as humanely as convenient.
We should make stronger animal protection laws.
Using animals to benefit ourselves is morally right.
Example organisations: ASPCA. RSPCA.
1988: Massachusetts
71% NO

2002: Florida
55% Yes

2006: Arizona
62% Yes

2009: Ohio
64% Yes

2008: California
64% Yes

2016: Massachusetts
78% YES

**State ballot initiatives to regulate farm animal housing**

“Animals deserve humane treatment!”

“Yes, absolutely!”

Activists

Consumers / Voting citizens
2008 California ballot proposition

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CON  Proposition 2 is too RISKY. Californians enjoy safe, local, affordable eggs. A UC Davis study says Proposition 2 eliminates California egg production. Instead, our eggs will come from out-of-state and Mexico. Public health experts oppose Proposition 2 because it THREATENS increased human exposure to Salmonella and Bird Flu. Vote No.

Farming = business = profit motivated…?
I learned that the issues aren’t so black & white.
“Corporate Social Responsibility” is changing food production
Animal welfare: necessary for the **social license** to continue producing food in the future

Can we feel good about our food?

Consumers / Voting citizens
Animal welfare science can help with decision making by bringing an understanding of what’s important for the animal.
Who am I? How did I get here? What is my goal?

What is animal welfare science?

How do different stakeholders view animal welfare?

What are some of the current and future considerations and priorities for dairy cattle welfare?
How do we study animal welfare?

**Biological science:** understanding the cow

**Social science:** understanding people
How do we study animal welfare?

**Biological science**: understanding the cow

**Social science**: understanding people
What is animal welfare?

State of individual animal

Poor welfare  Good welfare

Animal welfare science looks at the state of the animal – it’s outcome-based (facility-type & farm-size neutral)
What is important for animal welfare?

- Biological function (bodily health)
- Psychological state (mental health)
- Natural living (behavioral health)

What’s a “behavioral need”? How can we ask cows what matters to them?

1. **Preference testing**: “voting” with their feet

   ![Cow thinking about preference]
   I spend more time with “X” than “Y” because I **prefer** “X”

2. **Motivation testing**: asking them to “pay” to show how much they care about something

   ![Cow thinking about motivation]
   “X” is really **important** to me, so I’m willing to work hard to get it!
What is important for animal welfare?

- **Biological function**
  - Health
  - Performance

- **Psychological state**
  - + vs. – emotional response or state

- **Natural living**
  - Behavioral needs met
  - Lack of abnormal behavior

Fraser et al 1997, 2008
Cage-free aviaries vs. battery cages

**Body**
- + better leg bone strength
- – more keel bone damage
- – more severe foot lesions
- – double mortality rate

**Mind**
- – more pain
- – more fear
- + less frustration?

**Nature**
- + freedom of movement
- + natural behaviors
- – aggression
- – cannibalism
# Measuring animal welfare

<table>
<thead>
<tr>
<th>Resource-based</th>
<th>Animal-based</th>
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<tbody>
<tr>
<td>Characteristics of:</td>
<td>environment</td>
</tr>
<tr>
<td>Provides info about:</td>
<td>risk factors &amp; opportunities</td>
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<tr>
<td>indirect</td>
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Biological science: understanding the cow

Social science: understanding people
Today’s discussion: mostly US + Canada context, with some perspectives from Finland and elsewhere in Europe
“Consumers today don’t understand how their food is produced.

Maybe we need to tell our story better so they will learn the facts and accept what we do.”

“yes and no...”
Transparency is critical, but insufficient

RESEARCH ARTICLE

What Difference Does a Visit Make? Changes in Animal Welfare Perceptions after Interested Citizens Tour a Dairy Farm

Beth Ann Ventura¹, Marina A. G. von Keyserlingk¹, Hannah Wittman², Daniel M. Weary¹*

¹ Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada, ² Centre for Sustainable Food Systems, University of British Columbia, Vancouver, BC, Canada
Knowledge about dairy production practices increased

(education worked to convey facts)

perceptions of dairy production practices did not necessarily improve

(education did not always improve attitudes)

Educational farm visit had variable effects on people’s perceptions of welfare

- 44% no change
- 24% had improved perceptions of welfare
- 32% became more critical

Non-ag consumers

What values are shared vs. prioritized differently?

Decision makers

Producers

Consumers

body
mind
nature
The Five Freedoms

1) Freedom from **hunger** or **thirst**
2) Freedom from **discomfort**
3) Freedom from **pain, injury** or **disease**
4) Freedom to express (most) **normal behavior**
5) Freedom from **fear** and **distress**

Current form proposed by the Farm Animal Welfare Council of the UK
Biological functioning: high priority for producers

“Provision of adequate supply, such as **food** and **water**, together with good **health care**, makes good welfare”

Producers (focus group)

Biological functioning: consumers place high value too

- nutrition
- health
- lack of injury

Non-ag consumers

BEFORE farm tour, 72% of visitors had concerns about bodily health

Perceptions improved after farm visit when values relating to biological functioning were supported

24% had improved perceptions of welfare

- Care
- Nutrition
- Hygiene
- Space

Biological functioning: decision makers also prioritize freedom from injury or disease.
Different stakeholders agree on importance

On the same page

Producers
Decision makers
Consumers

Future goal (medium-term, ≤20 yrs):
⇒ rates of lameness, transition cow disease, calf morbidity

The public expects animals to have good health, but also other things as well...

Producers

Consumers

✓ nutrition
✓ health
✓ lack of injury

“That’s necessary, but insufficient”
Psychological well-being: decision makers

- Freedom from hunger, thirst, discomfort, pain, fear, distress
- Avoid mishandling/abuse
- Minimize pain: lameness, injuries, procedures (dehorning)

Psychological well-being: consumers

“Farm animals should be protected from feeling pain”

Routine practices should be done with pain control

Non-ag consumers

Rauch & Sharp, 2005
Psychological well-being: N. Am. producers

- Prioritize reducing *chronically* painful conditions, like lameness
- Some use pain control for dehorning calves

Producers

mind
Dairy farm changing policy following release of graphic video

Posted: 6:29 PM, Jan 17, 2019   Updated: 6:33 PM, Jan 17, 2019
By: Juliana Falk

WARNING: Video contains graphic content
Psychological well-being: EU producers

- No pain
- No stress
Different stakeholders have some **shared values**

**Producers**

**Goal** (immediate term): follow best practices established by research for managing pain and stress → “easy win” for public perception

Behavioral well-being: decision makers

Freedom to express (most) normal behaviors

Decision makers

nature
Behavioral well-being: producers

Natural environment (daylight, outdoor access), behavior opportunities, space... Should these really be a big priority?
Psychological well-being: producers

✓ freedom to move

Producers

nature
Psychological well-being: producers

“I think society values access to pasture…”

“… and this will become increasingly important in the future”
Behavioral well-being: consumers

- behavior opportunities
- outdoor access
- “buddies”

BEFORE farm tour, 66% of visitors had concerns about natural living

Non-ag consumers

Perceptions worsened after farm visit when values relating to natural living were not satisfied.

32% became more critical

- space?
- pasture?
- cow-calf separation?

Stakeholders’ priorities differ more in this area

Don’t always see eye-to-eye on how to prioritize…

...but there is opportunity to find common ground
Stakeholders’ priorities differ more in this area

Future goal (within a few decades):
Close the gap with public expectations
→ increase behavioral opportunities

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Some messages can backfire…

“We take care of our animals, and [in return] they take care of us”

Are animals a means to an end?
...plus, production and welfare don’t always have a causal relationship

“Our cows are producing well, so they must not be stressed, and their welfare is good”

Sometimes, but not always...

For example: pain control for dehorning
Some more goals for the present and future (within the next few decades) – calves

Outcomes:

✓ ↓ morbidity rates

✓ ↑ opportunities for social interactions

Some of the factors to consider to help reduce calf morbidity

Outcomes:

✓ ↓ morbidity rates
✓ ↑ opportunities for social interactions

Inputs:

✓ Ventilation (clean air)
✓ Set them up for success to use energy for growth:
  ✓ Prevent cold stress
  ✓ Dry bedding
  ✓ Feed (quantity + quality)
Ventilation = air exchange

Goal:
- remove dirty, contaminated air
- bring in fresh air
- ≥ 4x/hour

Positive-pressure tubes assist in directing air without creating a draft (to avoid chilling the calves)

Goal:
- remove dirty, contaminated air
- bring in fresh air
- ≥ 4x/hour

Give the calf the right tools so she doesn’t waste energy to keep warm

- Bedding (ideally straw) deep enough to **completely** cover the hind legs so the “nest” keeps the calf warm

- Feed sufficient **quantity** & **quality** of milk to give the calf energy to stay warm, fight off disease, and grow!

Some of the factors to consider to increase opportunities for calf social behavior

Outcomes:

✓ Reduce morbidity rates

✓ ↑ opportunities for social interactions

Arrangements:

✓ Current: pens for pairs or groups of calves

✓ Future: regular calf + dam/nurse interaction?

Some goals for the present and future (within the next few decades) – older cattle

Outcomes:

✓ ↓ lameness & transition-related diseases (painful)
✓ ↑ opportunities for movement/exercise
✓ ↑ opportunities for many important behaviors

Some of the factors to consider

Outcomes:

- ✓ ↓ lameness & transition-related diseases (painful)
- ✓ ↑ opportunities for movement/exercise
- ✓ ↑ opportunities for many important behaviors

Factors (inter-linked):

- ✓ ↑ comfortable lying
- ✓ ↓ unnecessary standing on hard surfaces
  - ✓ ↓ heat stress
  - ✓ ↓ stocking density (freestalls)
- ✓ exercise (tie-stalls)
Why does she do that?!!

Van Os, Goldstein, Weary, von Keyserlingk., in preparation
- When heifers are first introduced to freestalls:
  - lying time ↓
  - alley lying ↑
  - 77% of heifers in our study chose to lie down in the alley at first

- 54% of Norwegian farms reported having cows who refuse to lie in stalls

- Stalls can work well, but they don’t follow the cow’s natural behavior

- Open packs (indoors or outdoors) or pasture can be alternatives

Van Os et al., in preparation; O’Connell et al., 1993; Kjaestad & Myren, 2001; Kjaestad & Simensen, 2001; von Keyserlingk et al., 2011
Cows prefer to be outside... AND inside

Cows are motivated to go outside... BUT their preference for pasture vs. the barn depends on the context

Lying time decreases with heat stress

Time spent lying (h/24 h)

Air temperature (°C)

Chen et al., 2013 J. Dairy Sci. 96:5035-5045

See also: Chen et al 2016; Legrand et al. 2011; Overton et al. 2002
When cows are outside in warm weather, they want the benefits of shade

Cows are motivated to seek shade.

AND they prefer shade compared to the sun, even when cooled with water sprinklers

When cows are **indoors** in warm weather, they benefit from supplemental cooling.

Cows in the mechanically ventilated barn stayed cooler, even though they were higher producing.

Van Os, Mondaca, et al. in preparation.
When cows are **indoors** in warm weather, they benefit from supplemental cooling.

Showers further cooled the cows.

Van Os, Mondaca, et al. in preparation

See also: Chen et al. 2013, 2016
Behavioral well-being: some of the factors to consider

Outcomes:

- ▼ lameness & transition-related diseases (painful)
- ▲ opportunities for movement/exercise
- ▲ opportunities for many important behaviors

Examples:

- ▶ Grooming behavior
- ▶ Outdoor access
- ▶ Choices in the environment

Grooming is not just an “enrichment,” but an important behavioral need

Cows are as motivated to use a brush as they are to obtain fresh feed


Van Os, Goldstein, Weary, von Keyserlingk, in preparation

Naïve heifers use simple brushes within <4 minutes of first exposure
“Contrafreeloading” – cattle choose to put in effort

Beef heifers pushed heavy gate to access hay, even though same hay was freely available in adjacent, open feed bunk!

Van Os et al. 2018 PLoS ONE 13:e0193109
“Agency” – having choices – can be good for welfare

- **Choice** of indoor-outdoor access

**AMS**: opportunity to choose own schedule?

Take-home messages

1. Animal welfare = outcomes about health, performance, + psychological & behavioral well-being

2. Research in animal welfare can help advance discussions around expectations for animal care
Take-home messages

3. Animal welfare is an important component of sustainability and the **social license** to produce food.

4. Goal: continuous improvement toward meeting public expectations
   - ↓ rates of lameness, disease
   - ↑ behavioral opportunities