

# MOOVING COWS™

*A revolutionary approach to practicing cow handling skills*

Jennifer Van Os



VVMA Winter CE Conference  
Saturday, February 3, 2024



Department of  
Animal & Dairy Sciences  
UNIVERSITY OF WISCONSIN-MADISON

## Animal welfare: A multi-stakeholder issue requiring multi-disciplinary approaches

**biological science:**  
understanding animals



**social science:**  
understanding people



*Icons from the Noun Project*

## Dairy farmers expressed need for training

- ↓ personnel injuries
- ↓ cow injuries
- ↓ cow stress levels
- ↑ milking parlor efficiency
- ↑ milk yield
- ↑ consumer confidence



Breuer et al. 2000. *Appl Anim Behav Sci* 66:273-288; Hemsworth et al. 2000. *J Anim Sci* 78:2821-2831; Grandin, 2008. *Humane Livestock Handling*, Storey Publishing; Tonsor & Olynk, 2011. *J Agric Econ* 62:59-72; Robbins et al., 2024. *J Dairy Sci*. (<https://doi.org/10.3168/jds.2023-23496>)

## Training on cow handling hasn't been universal

As of 2018, only 55% of US dairy farms provided training on moving or handling cows

Challenges:

- lack of time
- lack of resources
- language barriers

USDA, 2018. *Health and Management Practices on U.S. Dairy Operations, 2014*; Sorge et al., 2014. *J Dairy Sci* 97:4632-4638.

## Annual continuing education

- Effective January 2020 (Version 4.0)
- Anyone on the farm who directly handles animals
- Must be documented
- "Training" is open ended



### Employee Training Record

Date: \_\_\_\_\_ Training Conducted by: \_\_\_\_\_

Select Topic Covered: **Stockmanship**

<input type="checkbox"/> Euthanasia	<input type="checkbox"/> Chemical	<input type="checkbox"/> Cows to Parlor	<input type="checkbox"/> Heifer Care
<input type="checkbox"/> Youngstock	<input checked="" type="checkbox"/> Stockmanship	<input type="checkbox"/> Newborn	<input type="checkbox"/> BQA and Vaccines
<input type="checkbox"/> Hoof Trimming	<input type="checkbox"/> Dystocia	<input type="checkbox"/> Hospital Protocol	<input type="checkbox"/> Commodity
<input type="checkbox"/> Milking Class	<input type="checkbox"/> Tractor and Equipment	<input type="checkbox"/> Animal Welfare	<input type="checkbox"/> Maternity
<input type="checkbox"/> Horsemanship	<input type="checkbox"/> Down Cow	<input type="checkbox"/> Calf Care	

Print Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Brief Description of What You Learned: \_\_\_\_\_

\_\_\_\_\_

<https://nationaldairyfarm.com/dairy-farm-standards/animal-care/>

## Dairy farmers expressed need for training

- ↓ personnel injuries
- ↓ cow injuries
- ↓ cow stress levels
- ↑ milking parlor efficiency
- ↑ milk yield
- ↑ **consumer confidence**

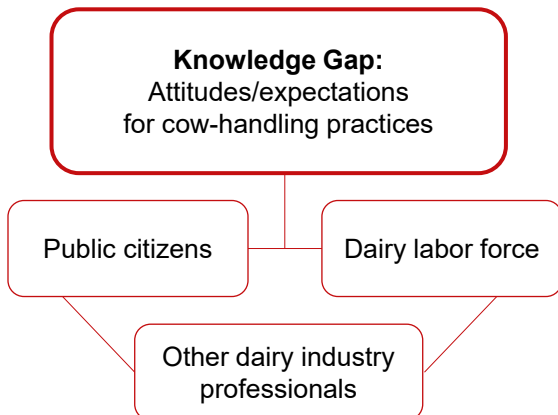


Breuer et al. 2000. *Appl Anim Behav Sci* 66:273-288; Hemsworth et al. 2000. *J Anim Sci* 78:2821-2831; Grandin, 2008. *Humane Livestock Handling*, Storey Publishing; Tonsor & Olynk, 2011. *J Agric Econ* 62:59-72; Robbins et al., 2024. *J Dairy Sci*. (<https://doi.org/10.3168/jds.2023-23496>)

## **Building public trust in dairy farming:** Understanding the role of farm culture, training, and risk factors that lead to poor animal handling

*This work is supported by the USDA National Institute of Food and Agriculture, IDEAS project 1022687*

### **Rationale**



*How aligned or disparate are these groups?*

## Are farmers wearing rose-colored glasses?

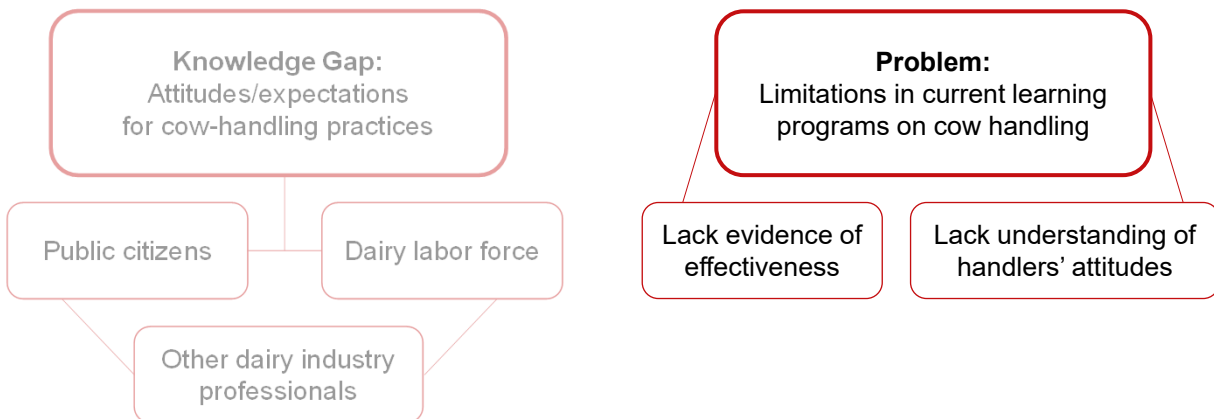
Previous research suggested:

- Farmers report a positive view of the welfare of livestock, whereas the public holds more negative views<sup>1,2</sup>
- Economically motivated animal use (e.g., dairy farming vs. companionship) → ↓ perceptions of capacity for animals to experience negative affect (i.e., suffer)<sup>3</sup>



<sup>1</sup>Te Velde et al. (2002); <sup>2</sup>Vanhonacker et al. (2008); <sup>3</sup>Serpell (2004)

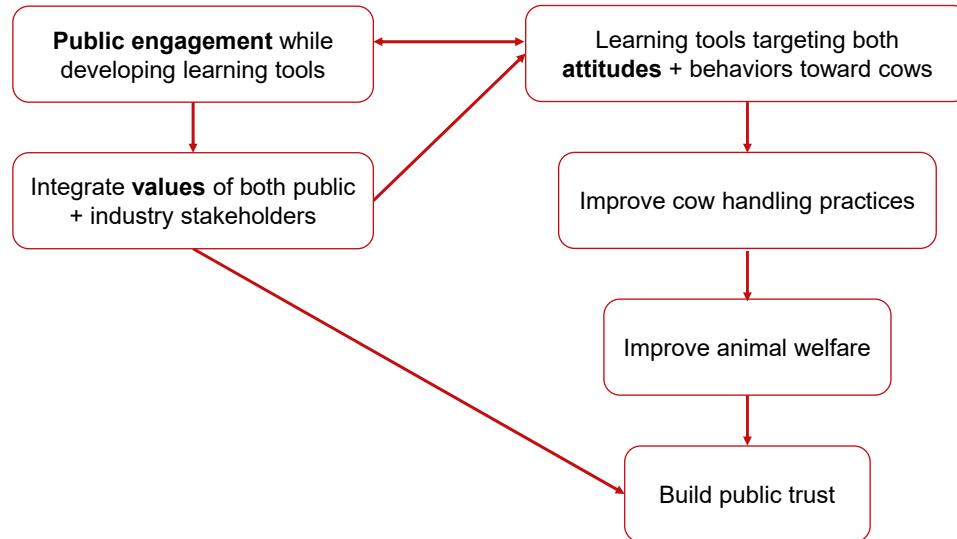
## Rationale



*How aligned or disparate are these groups?*

*How can we improve behavior modification?*

## Hypothesis



## Survey study on public vs. industry perceptions

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J. Dairy Sci. TBC  
<https://doi.org/10.3168/jds.2023-23496>

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### Perceptions of dairy cow handling situations: A comparison of public and industry samples

Jesse Robbins,<sup>1</sup> Kathryn Proudfoot,<sup>2</sup> Elizabeth Strand,<sup>3</sup> Lauren Hemsworth,<sup>4</sup> Grahame Coleman,<sup>4</sup> Paul Hemsworth,<sup>4</sup> Jeremy Skuse,<sup>4,5</sup> Peter Krawczel,<sup>6</sup> and Jennifer Van Os<sup>1\*</sup>

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<sup>3</sup>Veterinary Social Work, Colleges of Veterinary Medicine and Social Work, University of Tennessee, Knoxville, TN 37996

<sup>4</sup>Animal Welfare Science Centre, Melbourne Veterinary School, Faculty of Science, The University of Melbourne, Parkville, VIC 3052, Australia

<sup>5</sup>Scolexia Pty Ltd., Melbourne, Australia

<sup>6</sup>Department of Agricultural Sciences/Animal Science; Department of Production Animal Medicine/Research Centre for Animal Welfare; Helsinki One Health, University of Helsinki, FI-00014 Helsinki, Finland

## Public vs. industry participants

- Wisconsin **public**: n = 136 (PUB)
  - Stratified by U.S. census data (age, gender, educational attainment, income)
  
- U.S. **dairy industry** professionals: n = 201 (IND)
  - (professional networks, 'snowball' technique, email listservs, Facebook groups)

Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

## Video clip selection

- 12 video clips from public training videos (2), activist exposé (1), filmed by research team (9)
- Classified by our team as:
  - POS (n = 4): **positive**, unlikely to increase fear in cows (slow, predictable movement; any physical contact is gentle, including petting, stroking, or resting hand on cow)
  - NEG (n = 8): **negative**, aversive, likely to increase fear in cows (fast and sudden movements, shouting, or physical contact such as slaps, pushes, hits)
    - NEG1 (n = 4): lighter slaps, pushes, hits
    - NEG2 (n = 4): forceful slaps, pushes, hits; tail-twists

Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

Classifications based on: Sorge et al. (2014); Hemsworth et al. (2000, 2002); Breuer et al. (2000)

## Video clip editing and presentation

- Duration:  $14.3 \pm 4.5$  seconds (mean  $\pm$  SD; range 9 to 24 seconds)
- All in color, pixel size  $640 \times 360$ . 10 had sound, 2 were silent.
- Identifying characteristics blurred (human faces, company logos)
- Brief written descriptions ( $29.3 \pm 26.6$  words)
- Each video's questions appeared after enough time elapsed to watch it at least once
- Videos #1-2 (POS, NEG2) counterbalanced to norm respondents away from using only the ends of the response scales for subsequent videos. Order of videos #3-12 randomized.

Robbins et al., 2024. J Dairy Sci. (<https://doi.org/10.3168/jds.2023-23496>)

## Measures

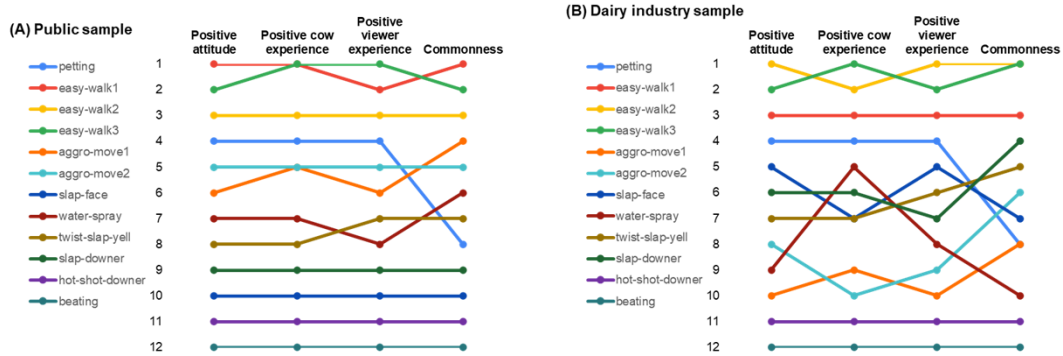
- Demographics
- Preexisting perceptions of how cows are treated on U.S. dairy farms
- Responses to each video:
  - Attitudes toward the behavior of the handler(s): acceptable, appropriate, humane? (7-pt)
  - Perceived commonness of behavior on U.S. farms (7-pt)
  - Perceived emotional experience of the cow(s): calm/agitated, at-ease/distressed, pleasant/unpleasant? (5-pt)
  - Personal emotional experience: calm/agitated, at-ease/distressed, pleasant/unpleasant? (5-pt)

Robbins et al., 2024. J Dairy Sci. (<https://doi.org/10.3168/jds.2023-23496>)



$P < 0.05$  between PUB and IND for at least 1 scale for every video clip

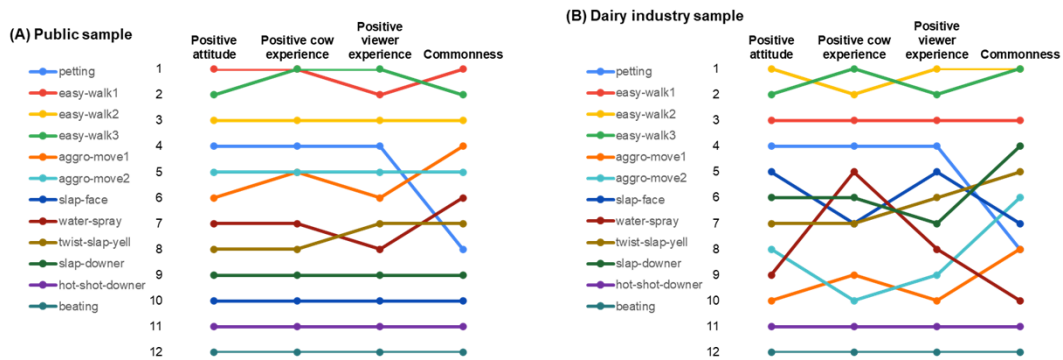
**Differences in degree, not kind:** Ratings differed quantitatively between the samples, but the relative rankings of the scenarios were similar in terms of attitudes and both cow and viewer experience.



Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

$r_s = 0.75$  to  $0.93$

Videos which were rated **more positively** (attitudes, cows' and respondents' emotional experiences) were perceived as **more common** in both samples.



Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

## Industry seeme more aware of cows' emotions

- Overall, across all scenarios, industry participants rated cows as experiencing ↑ negative emotion, compared to public.
- Our results contradict the idea of desensitization or rationalizing away animal suffering to reduce cognitive dissonance<sup>1</sup>
- Likewise, pig farmers have ascribed their animals with the capacity for suffering<sup>2</sup>

Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

<sup>1</sup>Serpell (2004); <sup>2</sup>Peden et al. (2020)

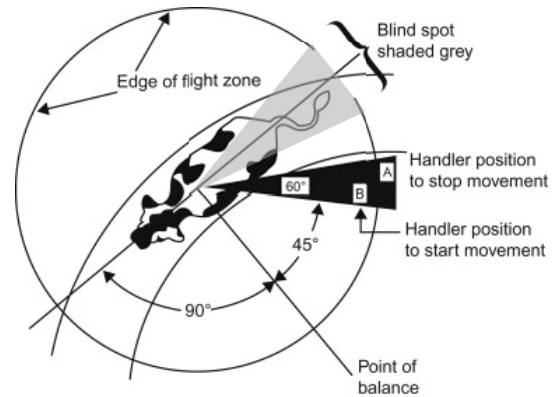
## Are farmers wearing rose-colored glasses?

- No. Attitudes toward cow handling practices were generally similar between the U.S dairy industry and Wisconsin general public, despite differences in knowledge of industry practices and in socio-demographic factors.
- Industry participants were perhaps more aware of cows' emotional states.
- The overall agreement we observed between IND and PUB stakeholders regarding dairy cow handling practices could perhaps provide a common starting point for addressing other, more contentious animal welfare issues.

Robbins et al., 2024. *J Dairy Sci.* (<https://doi.org/10.3168/jds.2023-23496>)

## How do we get low-stress handling to stick?

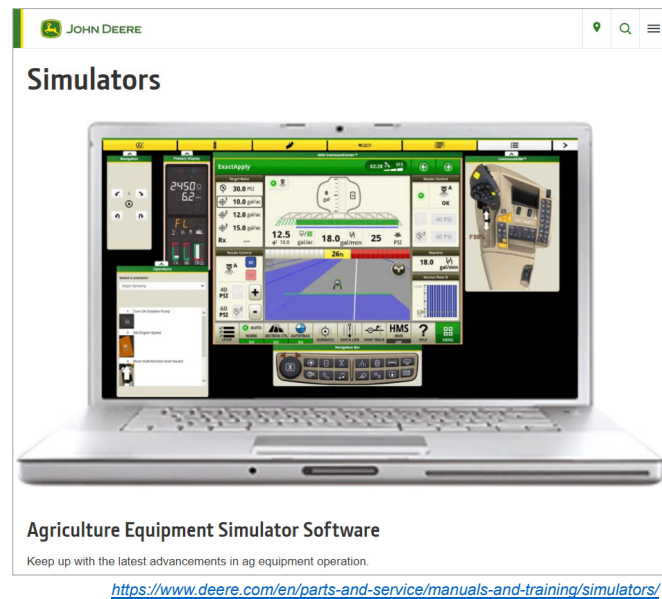
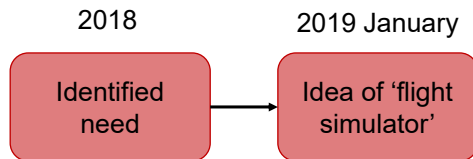
- The principles are well established...
- Why do people struggle to apply the concepts?



Grandin, 2008. *Humane Livestock Handling*, Storey Publishing

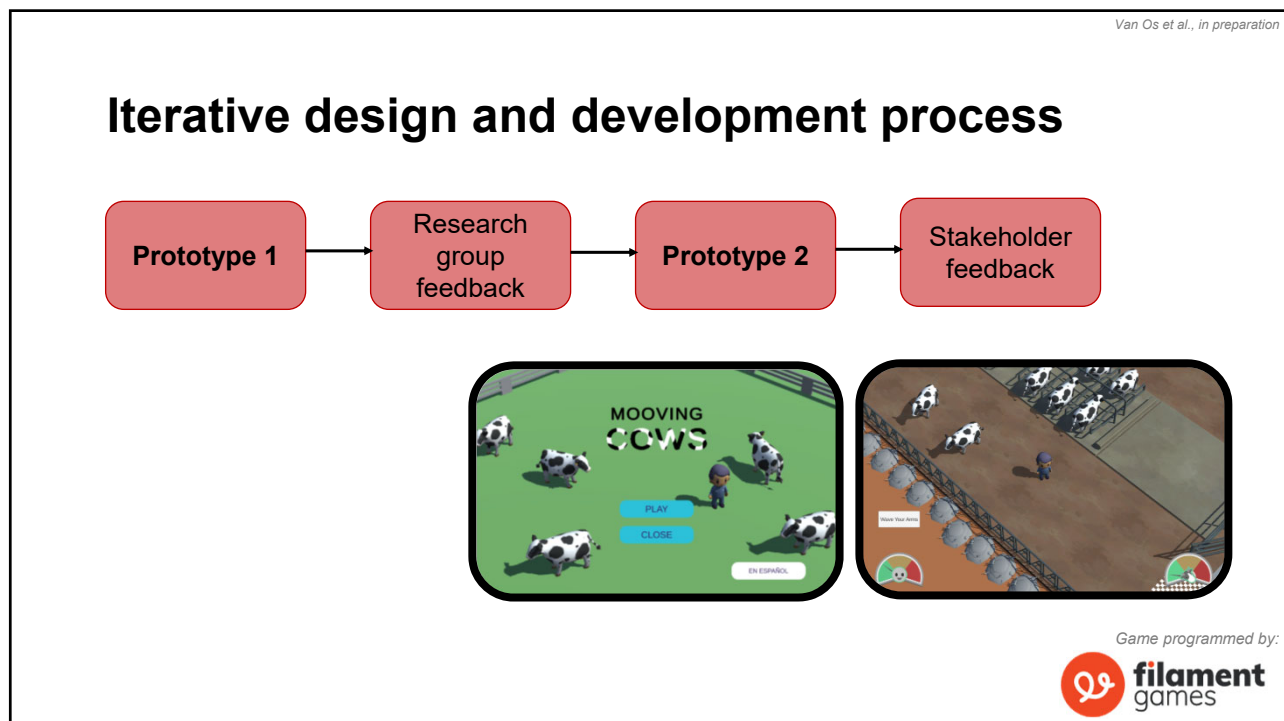
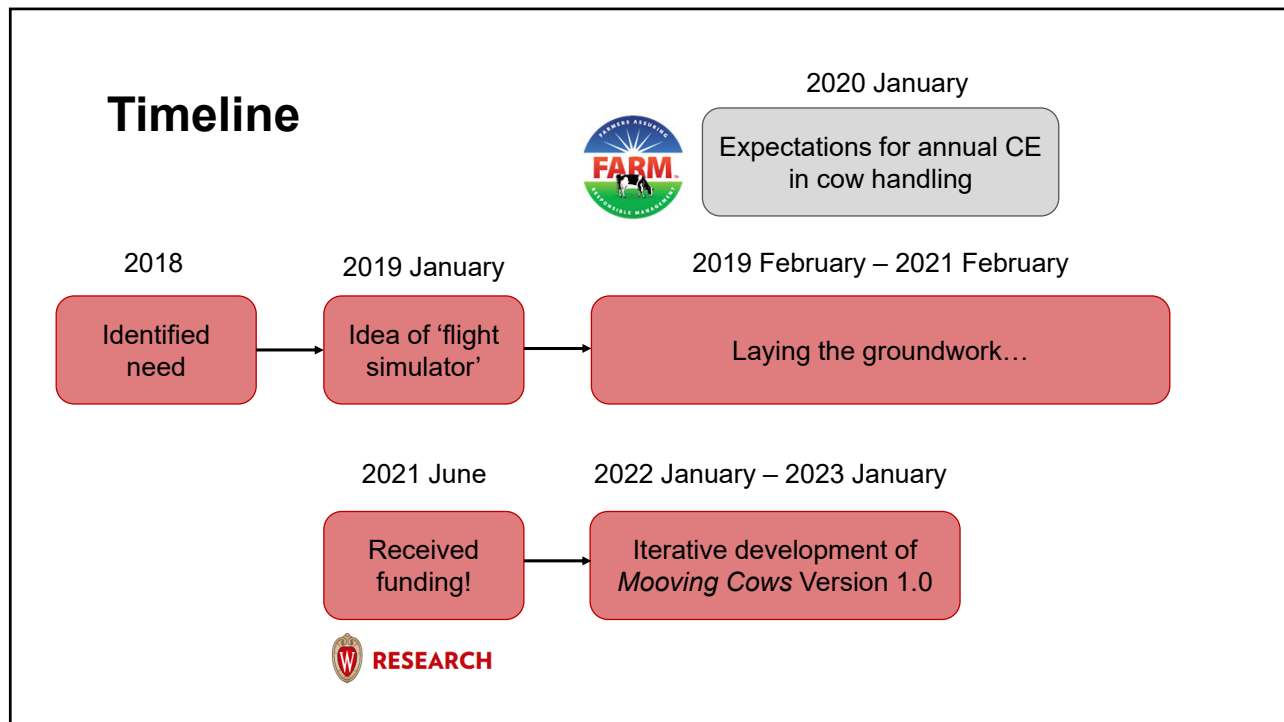


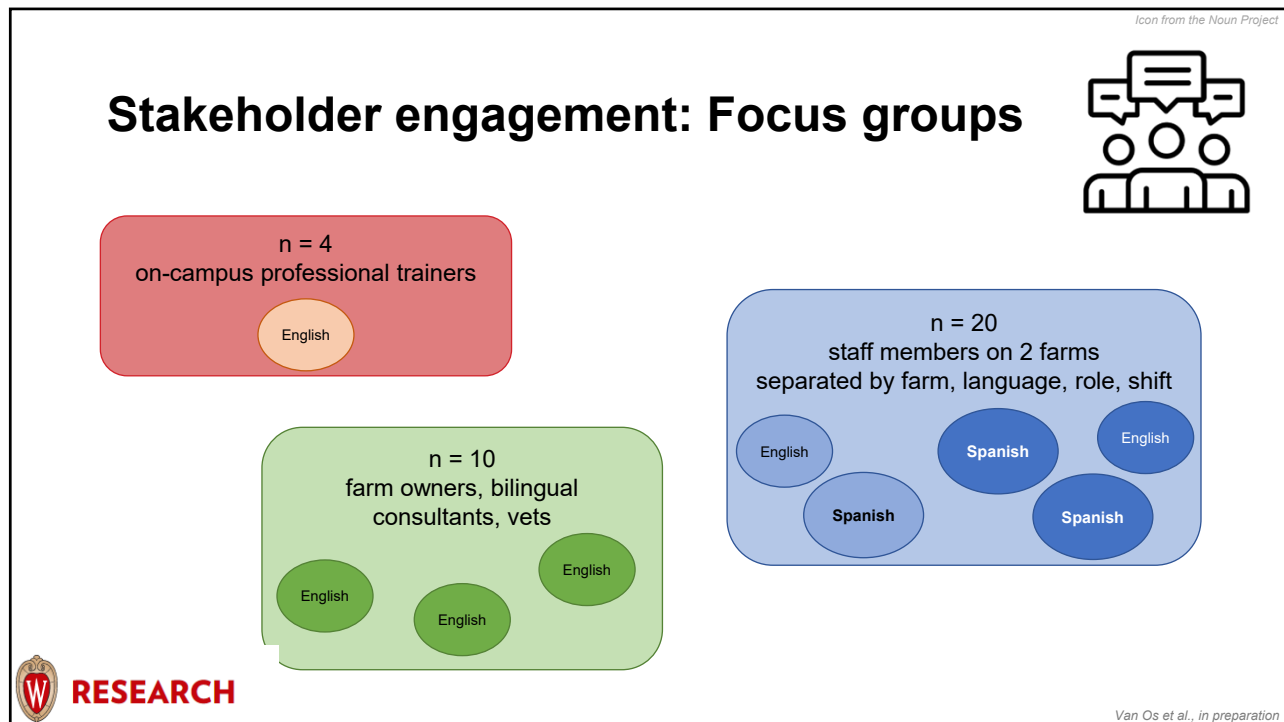
## Timeline



## Why a game?

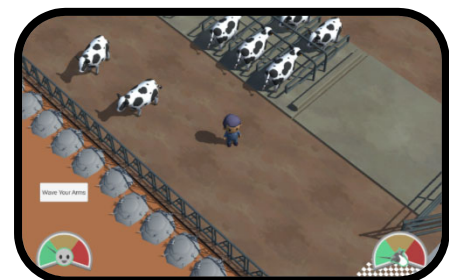
- “Serious games” have produced positive learning outcomes in:
  - ✓ military and professional training
  - ✓ classrooms
  - ✓ health-behavior education
- Games offer:
  - Engagement and interaction
  - Opportunities to apply concepts, practice skills
  - Superior learning and retention vs. conventional instruction



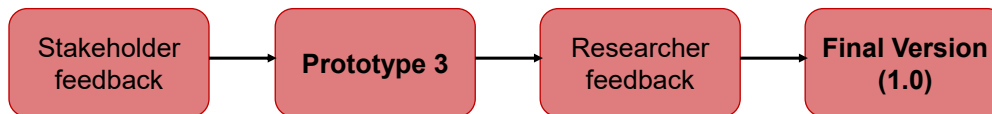


## Examples of feedback to improve the game

- **Game mechanics:** Players couldn't tell which way to go. Have character start at the gate, as well as zoom out to show whole environment.
- **Learning objectives:** More manure as indicator of cow stress ("the dirtier your character is, the worse job you did")
- **Art relevance:** Add water troughs, cow brushes, salt blocks



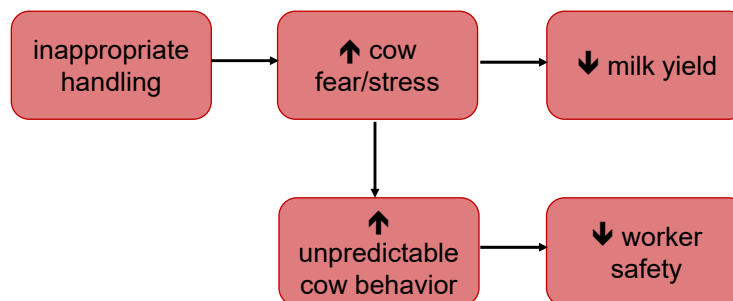
## Iterative design and development process



Game programmed by:

Van Os et al., in preparation

## Learning objectives of the game



## Why a video game?

### Benefits:

- ✓ active (vs. passive) learning – learn by doing
- ✓ visualization to help convey concepts
- ✓ immediate feedback
- ✓ experience situations that are challenging to mimic in real life due to cost, time, or safety
- ✓ controlled, safe environment to learn from mistakes

## Accessibility

- Designed with diverse end users in mind
- Must consider:
  - ✓ Linguistic appropriateness
  - ✓ Literacy levels
  - ✓ Cultural relevance

<https://blogs.extension.wisc.edu/languageaccess/>





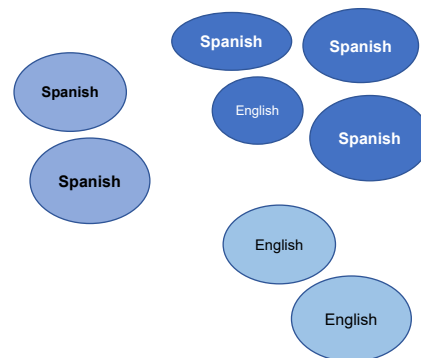
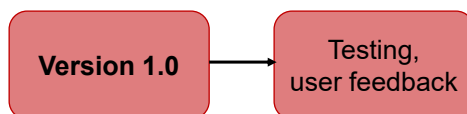
## Accessibility

In our game:

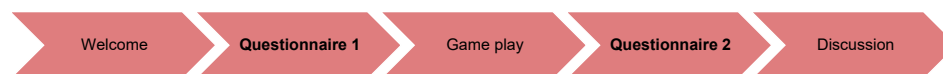
- Minimal written text
- Voiceover narration of all tutorial text
- Choice of 6 avatars to improve self-visualization and identification while playing the game



## Evaluation of full game



- Assessed change in knowledge on 3 new farms (34 people)
- Solicited feedback to further improve the game

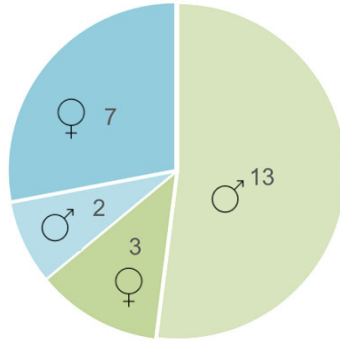


*Ruiz-Ramos, Van Os et al., in preparation*

## Participant demographics (n = 25)

English speaking

Spanish speaking



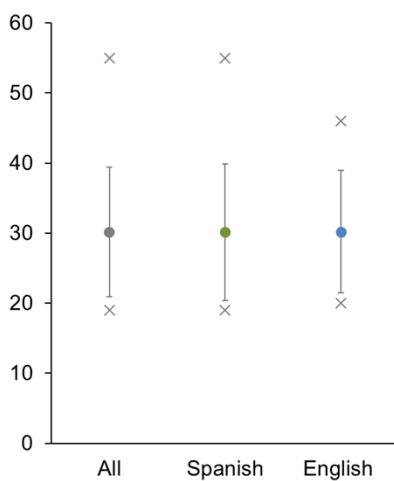
### Job roles

- ✓ Milk cows in the parlor (85%)
- ✓ Move cows to/from parlor (76%)
- ✓ Other (88%):
  - Herdsman, herd manager
  - Move and sort cows for animal health, breeding
  - Newborn, calf, down cow care
  - Bedding management
  - “Un poco de todo” (a little of everything)

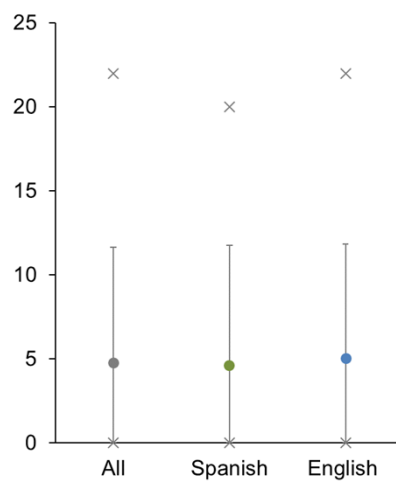
Started with n = 34 participants. Due to a procedural error, 9 participants did not complete the entire game (all Spanish-speaking, 7 male, 2 female).

## Participant demographics (n = 25)

Age (years)

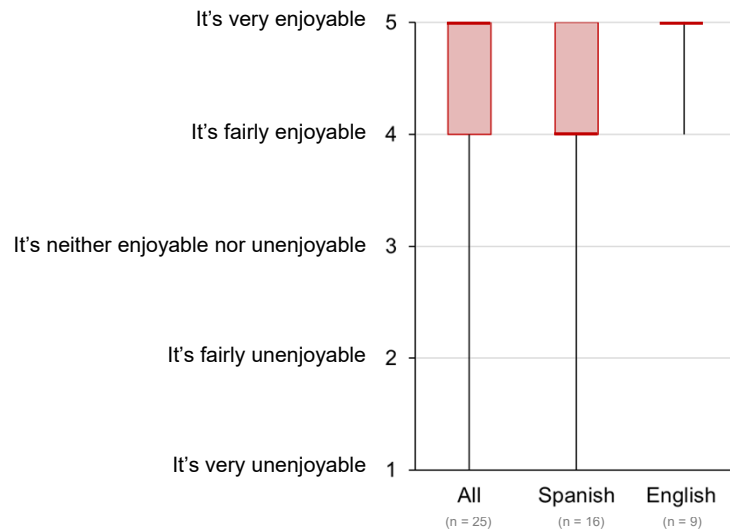


Years working on the current dairy farm



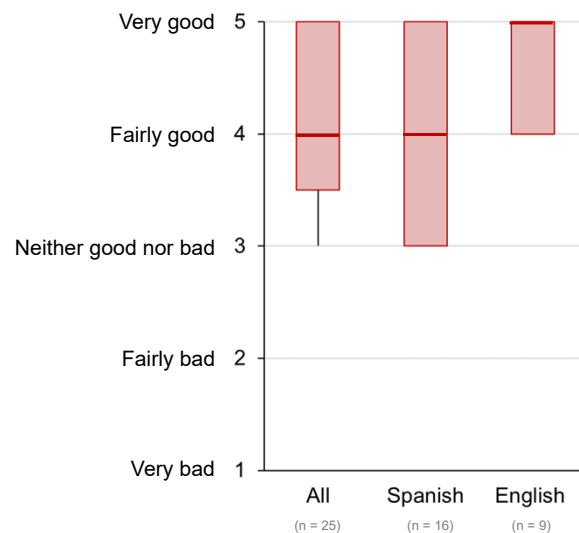
Ruiz-Ramos, Van Os et al., in preparation

## In general, how much do you enjoy working with dairy cows?



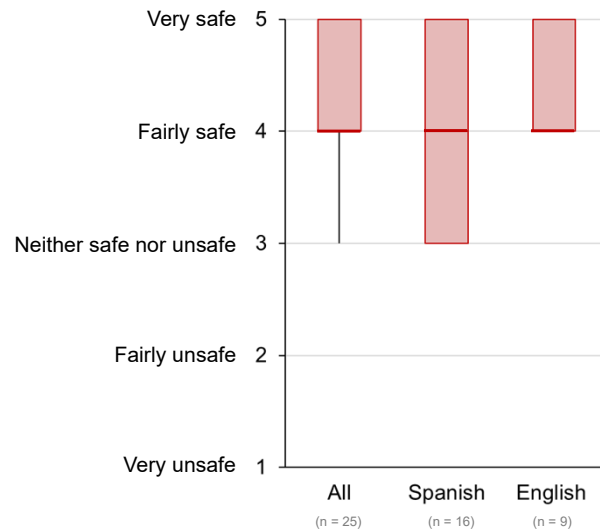
Ruiz-Ramos, Van Os et al., in preparation

## How good or bad do you believe are you at moving cows to where you want them to go?



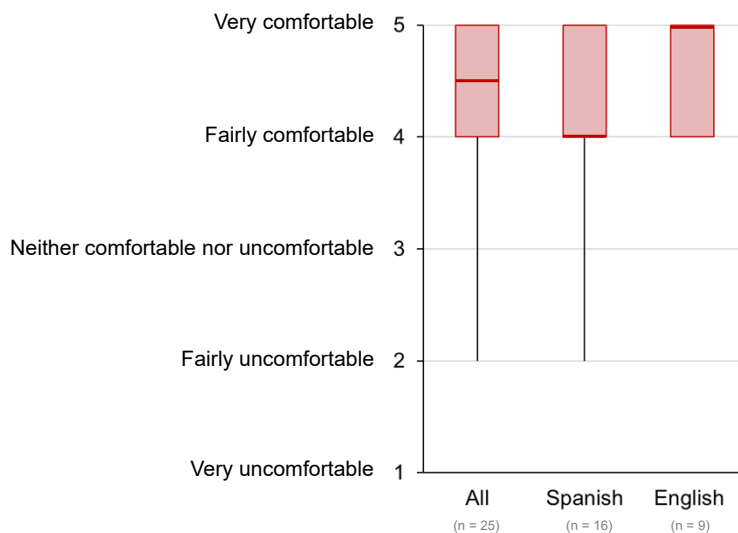
Ruiz-Ramos, Van Os et al., in preparation

## How safe do you feel when working with dairy cows?



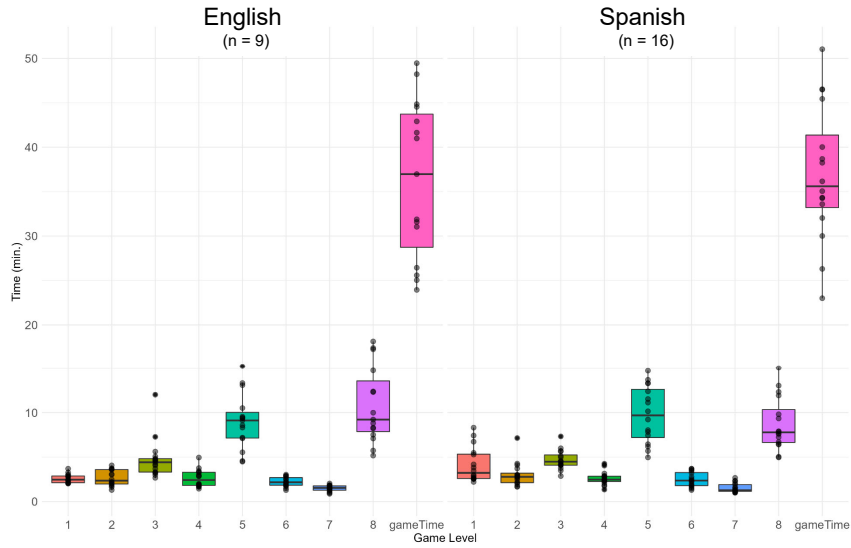
Ruiz-Ramos, Van Os et al., in preparation

## How comfortable do you feel with using smartphones or tablets?



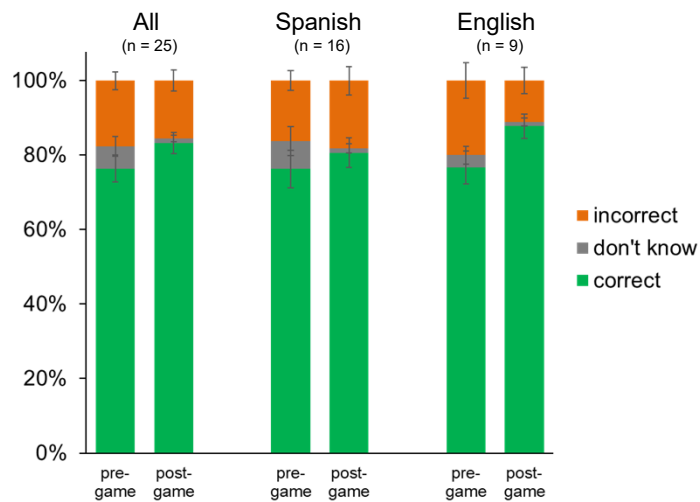
Ruiz-Ramos, Van Os et al., in preparation

## No language difference in game completion time



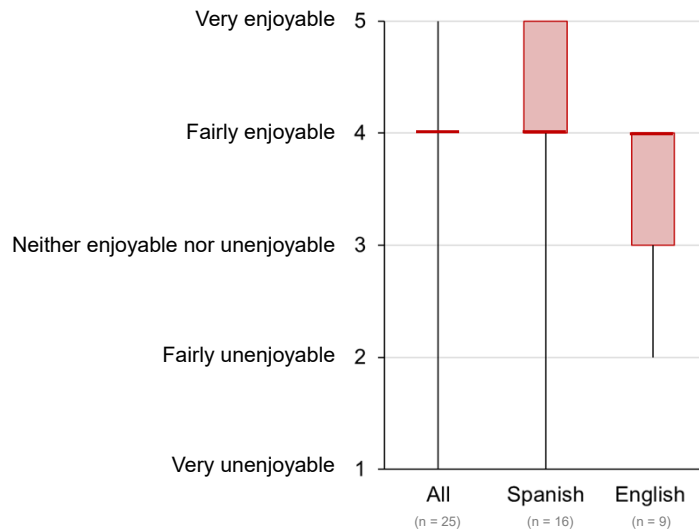
Ruiz-Ramos, Van Os et al., in preparation

## Knowledge improved after playing the game



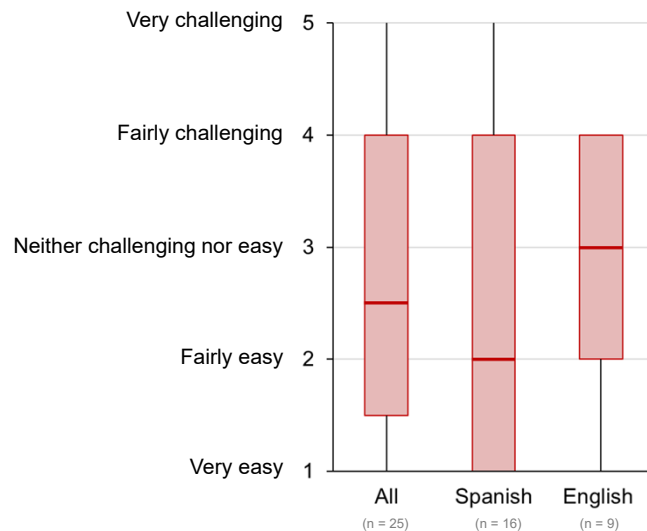
Ruiz-Ramos, Van Os et al., in preparation

## How enjoyable did you find the game overall?



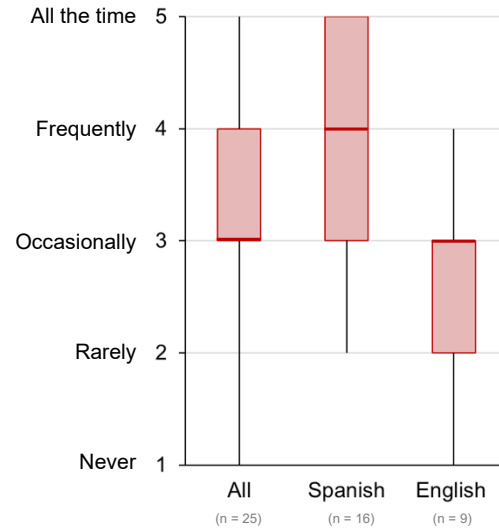
Ruiz-Ramos, Van Os et al., in preparation

## How easy or challenging did you find the game overall?



Ruiz-Ramos, Van Os et al., in preparation

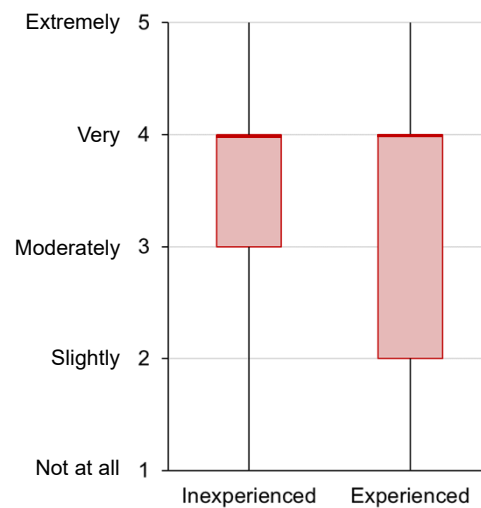
## How often would you want to play the game again in the future?



(n = 25)

Ruiz-Ramos, Van Os et al., in preparation

## How useful do you think the game would be for:



Someone with little to no experience working with dairy cows to learn how to handle cows

Someone who already has experience working with dairy cows to review handling practices

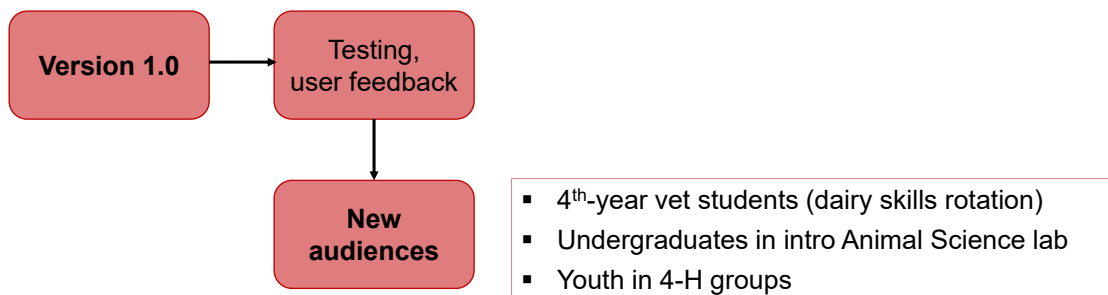
## Focus group discussions

- Cow-moving tasks in the game
- Character and cow behavior in the game
- Instructions provided in the game
- Feedback to players within the game
- Artwork in the milking parlor, freestall pens
- Character selection
- Ideas for future cow-moving scenarios
- Other ideas for improvements to the game



Van Os et al., in preparation

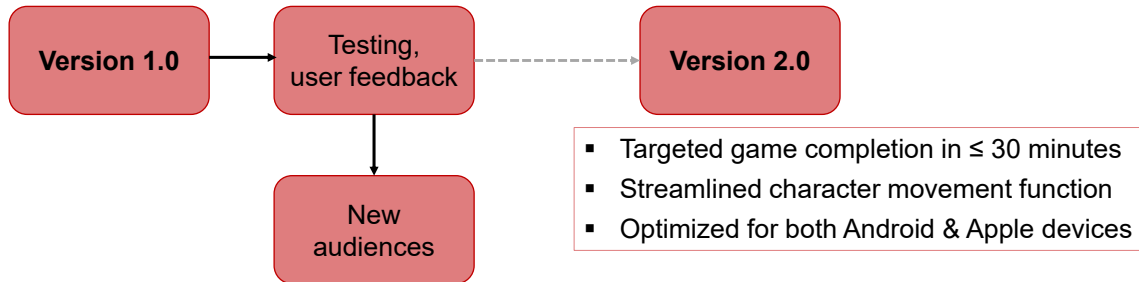
## Expanding testing with new audiences



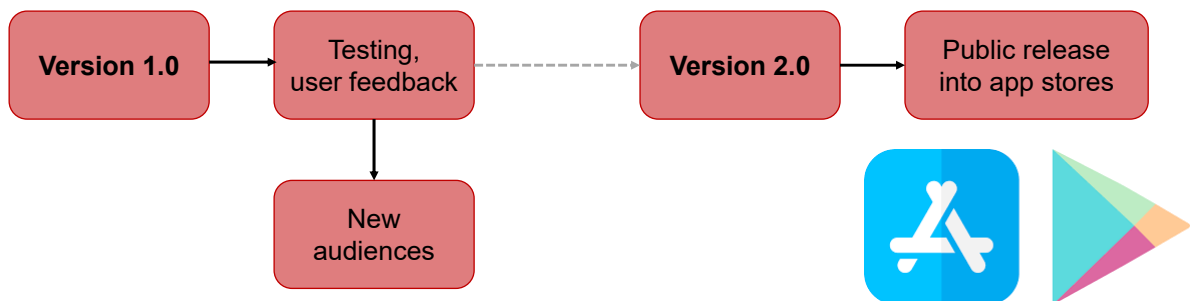
Van Os et al., in preparation



## Revised for public release



## Revised for public release



## Ideas for additional future scenarios

- Maternity/calving pen
- Sorting cows
- Fresh heifers in the parlor
- Rotary parlor
- Getting cows into headlocks (e.g., for breeding)
- Non-ambulatory (“down”) cow scenario
- Seasonal scenarios (e.g., icy patches)
- Cows getting loose out of a pen
- Foot bath
- Chute loading
- Trailer loading

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 **USDA** National Institute of Food and Agriculture  
U.S. DEPARTMENT OF AGRICULTURE



**RESEARCH**



DAIRY INNOVATION HUB

Game programmed by:



**filament**  
games



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