


# Is Your Calf Program Sustainable

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Notes:

*PowerPoint Slides on next page*



**Is your calf program sustainable?**

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- Professor Emeritus – Va. Tech – Dept. of Dairy Science
- Down Home Heifer Solutions, LLC

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**Sustainable?**

- The ability to endure, and to remain diverse and productive indefinitely.
- “Five pillars of sustainability” –
  - Dr. Frank Mitloehner – UC – Davis

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**Primary goal of all heifer rearing programs**

- Raise the highest quality heifer that can maximize profits when she enters the lactating herd.
- No limitations that detract from her ability to produce milk under the farm’s management system.
- Optimize profits by obtaining highest quality heifer in lowest possible cost in least amount of time.
- Raise the number of heifers required to meet the goals of the dairy business.

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**Is your calf program sustainable?**



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### What issues are driving sustainability of the calf enterprise?

- Welfare
- Environment
- Labor
- Food Safety
- Economic viability



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### Calf “welfare” Calf and consumer perspective



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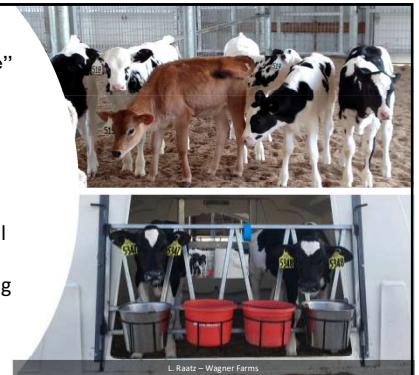
### Calf rearing is the focus for consumer perceptions of dairy – Univ. of British Columbia

- Animal welfare and consumer willingness to pay for yogurt- Napolitano et al (2008)
- Welfare of calves **transported** by road – Roadknight et al (2021)
- Prolonged cow / calf contact – Meagher et al (2019)
- Citizen views on practices of **zero grazing** and **cow calf separation** – Hotzel (2017)
- Comparison of selected animal observations ..... assess welfare of calves.... Bergman et al (2014)
- Symposium: Considerations for the future of dairy cattle housing: An animal welfare perspective. J. Dairy Sci. 103:5746

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### Impact of animal “welfare” on calf performance and consumer perceptions

- Paired or group-housed calves
  - Earlier starter intake
  - Adapt better to novel situations
  - Less stressful weaning
  - Jennifer Van Os



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## Pair housing – Wagner Farm – Iconto Falls, WI 650 Holsteins

- **Social Behavior**
  - Prefer having a buddy
  - They stay with their buddy when moved to larger groups
  - Easier transition to weaned calf facility
- **Less Antibiotics**
  - Eat more, grow faster, therefore less antibiotics
  - Healthier calves
  - Death loss: currently 0% for over a year
- **Challenges** – still feeding twice daily – learned behavior – labor in feeding and cleaning.



Picture – L. Raatz – Wagner Farm

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## Group Housing – Alternatives

Mob feeders

Acidified Free choice

Autofeeder



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## Group housing

- Requirements for group housing success:
  - Maternity
  - Colostrum management
  - Herd health
  - Facility design – ventilation and drainage.
  - Different managerial skill set
  - Limitation to maximum herd size with different systems?
  - Data availability and use with autfeeder system

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## Another aspect of welfare

### Traditional feeding program goals

- Limit feed milk – (<1.25 lb DM/DAY)
- Feed low fat CMR – (<20%)
- Why? – low cost/day and transition to ruminant at earliest age
- Is this normal for mammals?



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## Feeding and housing for calves

von Keyserlingk (2010)

- Milk feeding amounts – Ad lib vs restricted to 10% of body weight vs.
  - Higher BW gains, improved feed conversion, reduced age at first breeding (Diaz, 2001, Shamay, 2005)
  - Less vocalization
  - Fewer unrewarded visits to aut feeder
- Nipple vs bucket feeding – higher concentration of enzymes (de Passille, 1993)
  - Less cross sucking.

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## Impact of “better” nutrition – particularly the first month of life

### • Body condition



- Calves fed more milk
  - Reduced duration of scours from Crypto – (Olivett, 2012)
  - Greater leukocyte response to Salmonella – (Ballou, 2018)
  - Less mortality and clinical symptoms when challenged with Bovine Herpes Virus and Mannheimia – (Ballou et al)
- More milk during first and later lactation - Soberon et al, 2013

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## Advantages of body condition in preweaned calf?



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## Why do we raise calf in individual hutches/pens?

- Disease prevention
- Observation
- Tradition?

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**Optimizing returns – facilities to promote calf health, labor efficiency and labor effectiveness**

- Calf hutch as the “gold standard”???
- Labor involved in feeding liquid diet, calf starter, bedding, sanitation
- Impact of weather on labor
- Impact of weather on calves
- Retention of labor
- Minimizing shrink in liquid and dry diet
- Maintaining quality of liquid and dry diet

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**Seeking a win:win outcome**

**Calf**

**Consumer**

- More milk earlier in life
- Feed for genetic potential for growth
- Achieve benefits of paired or group housing
- Manage calves to achieve genetic potential
  - Records for proactive calf management
- Raise the number needed – maternity, newborn care, minimize morbidity and mortality

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**Transporting calves to calf rearing facilities?  
Another “welfare” issue?**

- Age at shipping?
- Length of “haul” without feed or water?
- US – 28h?
- DCHA- 24 h, then 5 hour stop
- AABP  
[http://aabp.org/Resources/AABP\\_Guidelines/transportationguidelines-2019.pdf](http://aabp.org/Resources/AABP_Guidelines/transportationguidelines-2019.pdf)
- Biosecurity with calves co-mingled from multiple source farms?

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**Canada – February 2020**

- Calves may be transported for up to 12 hours if dehydration, starvation and exhaustion are prevented??????
- Once 12 hours is reached, they must be provided with feed, water and rest.
- Calves 8 days and under may only be transported once and are prohibited from going to assembly centres.



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## Environment

- Impact of the calf program on the nutrient management plan for the dairy?
- N and P excretion by calves?
- 20 -40 g N/day, 3 – 5g P/day when fed ~ 1.2 – 1.5 kg DM/day (Hill, 2006)
- Climate is large determinant
  - “Wetter” climates must collect nutrient effluent from calf hutch sites.



Carol Highsmith - Library of Congress collection

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## Facilities for calves and nutrient effluent management

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## Labor availability and cost

- 2021 – meat and dairy employers requested 34,000 H-2A and 2B workers
- One in five livestock and dairy workers are foreign born. In Texas, 51% of dairy workers were immigrants

American Immigration Council – July 2022

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## Minimum wage and overtime

- Washington state – 200,000 farm workers
  - >40 hours/week – overtime pay
- California – phased in >26 or <25 employees
  - 9.5 to 8.0 h/day
  - 55 to 40 h/week
- New York
  - Minimum wage - \$14.20, overtime 60 h - \$21.30

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**What can be done to improve labor efficiency and effectiveness**

What can be done to improve labor retention?

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### **Calf care tasks**

- Maternity – calving, colostrum harvest/storage
- Newborn care – navels, vaccinations, colostrum feeding, transport
- Milk prep / pasteurizer / storage
- Milk replacer prep
- Milk feeding – bucket or bottle, sanitation
- Calf starter feeding
- Health team
- Housing - bedding, maintenance, sanitation

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### **Impact of rearing facility on labor effectiveness**



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**Labor efficiency and effectiveness**

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## Labor efficiency and effectiveness



- Efficiency ++++
- Shrink?
- Repetitive actions of adding and removing nipples?

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Do you have a system?

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## Food safety - Is this an issue for dairy calf programs?

- 55% of dairies fed unpasteurized milk – saleable and unsaleable.\*\*\*
- Feeding milk from treated cows is “off label use of antibiotics”.
- 38% fed medicated milk replacer
- Preweaned calf health
  - 21% diarrhea – 76% treated
  - 12% respiratory – 95% treated
- Primary antimicrobial
  - Tetracyclines
  - Cephalosporins
  - Tremethoprim/sulfa
  - Macrolides/florfenicol



NAHMS DAIRY 2014

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## Financial management – applied to calves!

- Historical = low cost/day
  - Limited milk
  - Early weaning
  - Early calf ranch approach – economy of scale, specialization and protocol development.
  - Is your calf program low cost/day or low cost for value product?
- What about optimizing returns?

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### Cost of raising heifers by stage of growth

	Birth to 200 lb	201 – 700 lb.	701- 850 lb.	851 – Calving
Feed	\$172	\$342	\$105	\$443
Labor	95	88	18	92
All other costs	97	310	116	469
Total	\$364	\$739	\$240	\$1017
% of Total Costs	15.4%	31.3%	10.2%	43.1%
% of Total Growth	8%	38%	12%	35%

What stage has a greater impact on health? What stage has greatest efficiency of growth? Influence on mammary development? .....

Karszes, Hill – Dairy Replacement Program: Cost and Analysis, Summer, 2019

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### Low-cost rearing – Is this a sustainable goal?

- DCHA goals
  - Survival
    - >97% - 24 h – 60 days
  - Morbidity
    - Scours - <25%
    - Respiratory < 10%



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### Preweaning morbidity

- Impact of respiratory disease on lifetime performance?
  - Rossini et al (2004) – Treat >2X = reduced herd life and increased AOFC.
  - Bach et al (2010) – Treat >4x =1.87 odds of not completing 1<sup>st</sup> lactation.



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### Optimizing our returns – biology and \$\$\$

- Instead of cost/day – cost / lb(g) of gain
- Biology and \$\$\$ of nutrition
- Nutrient requirements for maintenance and gain

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## Growth rate

- Double birth weight by 56 days?
- 85 lb. birth weight = 1.5 lb. / day
- What is genetic potential for growth?
- Heifers that completed 2<sup>nd</sup> lactation grew more between 12 to 65 days of age than those that did not. (Bach, 2010)
- Each lb. of preweaning ADG = 850 - 1,130 lb. more milk in 1<sup>st</sup> lactation (Soberon et al)



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## Impact of environment on ADG

Whole Milk Intake Quarts	Environmental Temperature (°F)			
	Allowable gain	68	40	20
4	Energy	.85	.36	Lose weight
	Protein		.83	
	\$/lb gain	<b>\$1.81</b>	<b>\$4.27</b>	infinite
8	Energy	2.47	2.1	1.9
	Protein		1.9	
	\$/lb gain	<b>\$1.25</b>	<b>\$1.47</b>	<b>\$1.63</b>

Calves lose weight at 4 quarts when temperature is less than 30°

Calves continue to grow regardless of temperature at higher feeding rates

**Most important during first 30 days of life when limited starter intake**

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## Cost per pound of gain for 120-lb. calf

Type of milk	2qt. Twice Daily	3 qt. Twice Daily
Whole milk 3.25 PR 3.75 Fat	\$2.95	\$2.04
Milk Replacer 20%CP, 20% FAT, 12.5% S	\$3.23	\$2.07
Milk Replacer 24%CP, 22% FAT, 12.5% S	\$2.66	\$1.79
Milk Replacer 26%CP, 17%FAT, 12.5% S	\$2.39	\$1.82
Milk Replacer 26%CP, 24% FAT, 12.5% S	\$2.48	\$1.71
Milk Replacer 28%CP, 20%FAT, 12.5% S	\$2.24	\$1.67

Robert Corbett – May /June 2018 – Dairy Herd Management

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## Optimizing returns – raise what you need!

- Cost to rear replacement heifer exceeds their market value.
  - 2019 Dairy Replacement Cost - \$2,094 – \$2,607 - J. Karzes.
- Selling surplus replacements is not usually profitable. 1/6/2023 USDA / AMS - \$1,338
- Biosecurity risk of purchasing replacements.

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### Optimizing returns - cont'd.

- Control involuntary culling rate in milking herd
- Raise what you need.
  - Calf mortality – minimize
  - Optimize potential of what you raise
    - Nutrition
    - Health

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### How do you “manage” your calves?

- to handle or direct with a degree of skill: such as:
- to exercise executive, administrative, and supervisory direction of, manage a business
- Hmmmm.... Apply this to the calf enterprise

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### Essentials for calf management

- Calf management team – feeders, managers, herd management, DVM, industry partners
- Communication pathways
- **Records – minimal lag and relevant to achieving goals (growth, health, financial).**
- Commitment to improvement.

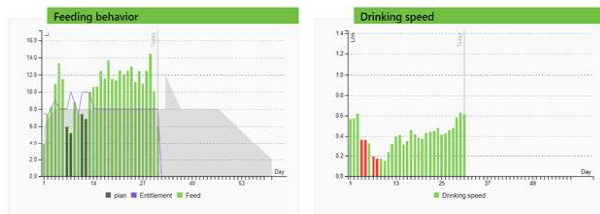
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### Impact of technology

- Robotic milking – Are these herds managed differently than conventional herds?
- Apply this mindset to managing calves
- Data for calf management?
  - Consumption, drink speed, breakoffs, unrewarded visits, treatments

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## Use of calf feeder data to better manage calf health (calfblog.com) – Cantor et al



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## What does the future hold and are you ready?

- Where is your calf program now?
- Where do you want it to be?
- How will you get there?
- Is your calf program important to your farm?

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## Is your calf program sustainable?

- Plan for the future
- Feeding for success – health and future milk
- Housing system – paired or group housing
- Labor effectiveness and efficiency
- Environmentally compatible.
- Economically sustainable
  - Raise what you need.
  - Control morbidity and mortality
  - Manage your calf program with the same mindset as your cows!

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