### Felipe Andrés Bañados Schwerter University of British Columbia Undistinguished Lecture Series 2020

# Got milk, part one Farming

Except when noted, all photos (C) Felipe Bañados Schwerter or (C) Maria Luisa Schwerter



## TW: May contain gruesome, explicit information and content about animal farming practices

Do not blame me if this affects your relationship with dairy products.

# I comilk.









Bonus tracks: The farmers' racket & the Got Milk ads

Bistribution · You







# Agenda

### Maybe a cow is a compiler from grass into milk.

- "Bootstrapping a cow":
  - Week 1: A 🍲 is born
  - Year 1 : Animal husbandry
  - Year 2 : Heifer becomes cow
- Milking a cow
- The milk leaves the farm
- Feeding the cows (Time permitting)
- Cleaning around (Time permitting)

# Week 1: A is born

- Separation from the mother into individual pen
- Feeding of Colostrum
- Move to standard milk feed and group pen



## You are a bull calf: not good. Depends on the farm operation

- Same 1st week as heifers.
- Dairy only: Sell ASAP.
- Beef operation too:
  - May share lot with heifers until weaning
  - Castration (in Canada before 6mo)
  - Feed until right size and selling



Auction Hall in Puerto Montt, Chile. (C) 2020 FEGOSA (Fair use for education)

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Auction Hall in Puerto Montt, Chile. (C) 2020 FEGOSA (Fair use for education)

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TOP & GOT



## Year 1: Husbandry When I was a kid, there were two kinds of dairy farms

Identification and branding



## Year 1 : Husbandry When I was a kid, there were two

### Identification and branding

CCIA CCIA @CCIA\_Canada Did you know that each tag brand has its own applicator? Some things are just better together. For optimal results, pair the approved applicator with the correct tag.#approvedCCIAtags





NLID



cContent/PDFS/EN/Services/JagPositioning/TagPositioning\_EN/pdf ww.holstein.ca/Publi

> Agri-Traçabilité Québec ISO 9001-2008 Certified

## Year 1 : Husbandry (Translation into heifer normal form)

- Identification and branding
- Week 3-Horns are dangerous.
- 5-8th week: weaning
- Moving outside
- (4-6mo): "Normalization" of the udder





ALL ALL ME



• We need to get the heifer pregnant.



- We need to get the heifer pregnant.
- Detecting Estrus
- Bulls are dangerous!





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- Detecting Estrus
- Bulls are dangerous!

Photos on this slide from ABS global (https://www.absglobal.com/)





# Artificial Insemination

- Facilitates management.
- You get to have a bucket of liquid nitrogen at home.
- Catalog of Bulls for genetic properties

Background photo from ABS global (https://www.absglobal.com/)



## Ranada Bull Search V2.1.20200904.1 Artificia

**C3PO** | 29H019122 | BOMAZ C3PO-ET

### Pedigree

- SIRE: BOMAZ SKYWALKER-ET
  DAM: BOMAZ DELTA 7173-ET
  MGS: MR MOGUL DELTA 1427-ET
  MGD: BOMAZ FRIDO 6185
  MGGS: APINA ALTAEMBASSY-ET

Facilitates

- You get to
- Catalog of •

**TransitionRight**®

**Real World Data** 

**Reg. Number** 003150307030 Date of Birth 2018-07-15 432 aAa DMS Beta Casein A2/A2 Kappa Casein BB Canadian Dairy Network 08/2020

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Background photo from ABS g

Production	Dtrs:0 Herds:0 Pro\$:+2978	B LPI:+3323
Milk	+1286 Kg	79% Rel
Pro	+72 Kg	+0.26%
Fat	+107 Kg	+0.52%
Health & Fertility		
HL		106
DF		107
SCS		102
MSP		106
МТ		103
Lactation Persistency		103
Recessives and Haplotypes	HH1T, HH2T, HH3T, HH4T, HH5C, HH6T, TC, TD, TL, TN TV, TY	N, TR, TS,
Calving Traits		
CA		105
DCA		107
Conformation	Dtrs:0 Herds	:0 <b>Rel:</b> 75%
	-10 -5 0 5 10	

	-10	)	-5	U	J	10	
Conf							3
MS							6
F&L							-1
Dairy Strength							-1
Rump							-2
Stature							-7
Chest Width							0
Body Depth							-3
Angularity							+1
Rump Angle							-2 H
Pin Width							-4
RLSV							-6 S
RLRV							-3
Foot Angle							-1
Fore Udder Attachment							+8





Mon, Oct 26, 2020

## J.S. World Business Tech & Science Culture Newsgeek Sports Health The Debat

## WORLD

# **Massive Semen Explosion after Blaze Hits Bull Artificial Insemination Facility, Firefighters Forced to Dodge 'Projectiles'**

BY EWAN PALMER ON 9/17/19 AT 10:14 AM ED

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**FUUL AIIYIE** Fore Udder Attachment

+8

- I





- Doses stored on liquid nitrogen
- Thaw at 95-98F for 30sec
- Dry the cartridge
- Load the gun
- Cover with sheath
- Inseminate the cow.

http://nwdistrict.ifas.ufl.edu/phag/2020/05/29/tips-for-successful-artificial-insemination-of-cattle/



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Sanitary covers Tweezers

Straw-cutter







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- We need to get the heifer pregnant.
- Detecting Estrus
- Bulls are dangerous!
- Artificial Insemination
- Gestation: 283 days (about 9.4 mo)



# Birth complications on the cow

- Days before estimated birth date cow is moved to a nursery pen
  - It's easy to tell when free range cows went into labor but harder to deal with complications.
- Stuck babies that must be pulled (twisted/mispositioned inside the womb, etc)
- Hypocalcemia





# Milking the cow

- By hand? NOPE
- The Milking pipeline
- Architectural
  - Parallel / herringbone
  - Rotary
- Robot (eg DeLaval VMS)



### **UBC** Dairy Education and **Research** Centre

PLANTECH DESIGN & DRAFTING **OMEGA & ASSOCIATES ENGINEERING OMEGA & ASSOCIATES ENGINEERING KEEN ENGINEERING** MURPHY DESIGN SERVICE **CASCADE ENGINEERING** 

### **Construction:**

SITE WORKS: **BUILDING SHELL:** PARLOUR: MANURE SYSTEMS: STALLS, GATES, RAILS: PLUMBING / HEATING: **ELECTRICAL:** PRECAST WALLS: CURTAINS:

TIMBERWOOD DEVELOPMENTS LTD. VALLEY WEST BUILDERS VALLEY DAIRY EQUIPMENT PACIFIC DAIRY CENTRE J&D FARMERS DAIRY SERVICE RAN-DEL PLUMBING & HEATING PHASE ELECTRIC **ADVANCE PRECAST** JONKMAN EQUIPMENT

### **JUNE 2000**







### Before milking





1. Monitor udder health regularly

### 2. Follow the right milking order

### **During milking**



5. Check milking vacuum



6. Attach milking cluster in time

### After milking



9. Disinfect teats immediately



10. Clean/disinfect milking equipment





3. Always foremilk



4. Clean and/or disinfect teats before milking



7. Avoid overmilking



8. Detach milking cluster correctly

11. Ensure proper milk cooling



12. Regularly monitor milking results







### **Efficient Milking**



Mouthpiece

Pulsation chamber

Vacuum



# How much milk?



https://www.dairyinfo.gc.ca/eng/dairy-statistics-and-market-information/dairy-animal-genetics/average-milk-production-by-breed/?id=1502476121954

## **Rinse and repeat**

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Artificial Insemination usually in the firs
Two months before labor: dry therapy.

### Artificial Insemination usually in the first month after returning to milking

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# The milk leaves the farm

Manner

Farm

USDOT 2081015

Wikimedia Commons

• Milk quality test on sample:

Temperature / Water / antibiotics

Fat/ Protein %, CFU and SCC









# Cleaning around

Table 1: Average daily manure production and nutrient content of manure. Values are and an animal unit (1000 lb) and do not include bodding\* م ما

Animal Type	Daily	Analysis Units	N	<b>P</b> <sub>2</sub> <b>O</b> <sub>5</sub>	K <sub>2</sub> O
	Production				
Dairy Cow	13 gal	lb/1000gal	28	13	25
Lactating (liquid)					
Lactating (solid)	106 lb	lb/ton	10	4	8
Dry	82 lb	lb/ton	9	3	7
Calf and heifer	87 lb	lb/ton	7	2	7
Beef cattle	60 lb	lb/ton	11	7	10
Cow and calf					
Steer	75 lb	lb/ton	14	5	8
Veal	5 gal	lb/1000 gal	36	27	55
Swine	4 gal	lb/1000 gal	30	35	15
Gestation					
Lactation	10 gal	lb/1000 gal	25	20	15
Nursery	14 gal	lb/1000 gal	40	40	25
Grow-finish	11 gal	lb/1000 gal	50	55	25
Farrow to feeder	7 gal	lb/1000 gal	40	35	15
Sheep	40 lb	lb/ton	23	8	20
Horse	45 lb	lb/ton	12	5	9

\*Adapted from: The agronomic guide 2002. College of Agricultural Sciences, Penn State University.

UMass Extension Crops, Dairy, Livestock, Equine – www.umass.edu/cdl

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## If you are interested in learning more Canadian National Farm Animal Care Council Codes of Practice

Beef cattle: <u>https://www.nfacc.ca/pdfs/codes/beef\_code\_of\_practice.pdf</u>
Dairy Cattle: <u>http://www.nfacc.ca/pdfs/codes/dairy\_code\_of\_practice.pdf</u>
Veal Cattle: <u>https://www.nfacc.ca/pdfs/codes/veal\_cattle\_code\_of\_practice.pdf</u>

My Grandma's llamas say hi to you today





# A dedication poem

I dedicate this talk now to Greg Morrisett\*, whom I've never met, but I am told he likes cows.

\*Member of the External Review committee for our department this year

### Quora

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### Greg Morrisett · July 31, 2014

Dean of Computing and Information Sciences at Cornell University

### Why is Professor Greg Morrisett so fond of cows?

In the early 1400's, a small baby was deposited in a field by some unknown parents. The child awoke to find himself surrounded by white legs with black spots on them. (Or were they black legs with white spots?) The herd of Herefords felt sad that the boy was left on his own, and took it upon themselves to raise him.

The boy, never lacking for milk, ice cream, or cheese, grew into a strapping young man, at which point he finally noticed that his benevolent keepers lacked opposable thumbs, or indeed digits of any sort. He thus took it upon himself to do the office work for the cows, including data entry, filing, and occasional accounts receivable tasks. In short, he mastered the fine art of QWERTY, and found his second love---the cowmputer.

One day, the boy asked the elder matron of the herd a series of philosophical questions such as, "Who am I?", "From where did I come?", and "Where is the beef?". The matron, batting her large eyelashes, responded in an oblique manner: "McDonald's" she said.

And with that, the boy left the herd in search of golden arches. It is there he discovered the dark arts of the cattle industry including grilling, roasting, and the occasional steak tartare. The rest, as they say, is history.