

Artificial Lamb Rearing: Transitioning from nuisance to potential profit center

Presenter:

**Russell Burgett, Program Director
National Sheep Improvement Program**



Host/Moderator: Jay Parsons

March 3, 2020



This webinar is made possible with funding support from the Let's Grow Committee of the American Sheep Industry Association.

Background

- Profitability is largely determined by pounds of lamb marketed per ewe exposed
 - ↑ prolificacy, ↑ production efficiency
- However, extremely high levels of prolificacy may not be sustainable for ewes in extensive management







Triplet Lamb Performance

		No. present at:				
Litter Size	No. of Litters	3 d	14 d	30 d	Weaning	Weight Weaned
1	81	0.98 ^a	0.96 ^a	0.95 ^a	.94 ^a	40.4 ^a
2	269	1.89 ^b	1.86 ^b	1.81 ^b	1.77 ^b	58.9 ^{bc}
3R	94	2.08 ^c	1.96 ^b	1.91 ^b	1.79 ^b	55.0 ^b
3A	89	2.72 ^d	2.48 ^c	2.25 ^c	2.13 ^c	62.9 ^c

Experiment 2:

55.3% probability that a purebred triplet would be present at weaning

65.5% probability that a crossbred triplet would be present at weaning

Triplet Lamb Performance

- 100 triplet litters would wean 20 more lambs than 100 twin litters
 - Also produce additional 75 dead lambs to loss
- Little benefit to increasing litter size above 2.2 lambs per litter (Notter et. al., 2018; Borg et. al., 2007)
- Efficient artificial lamb rearing system can reduce that pressure.

Artificial Lamb Rearing

- Characteristics
 - Improve animal welfare
 - Cost effective
 - Labor efficient
 - Automated when possible



Which Lambs?

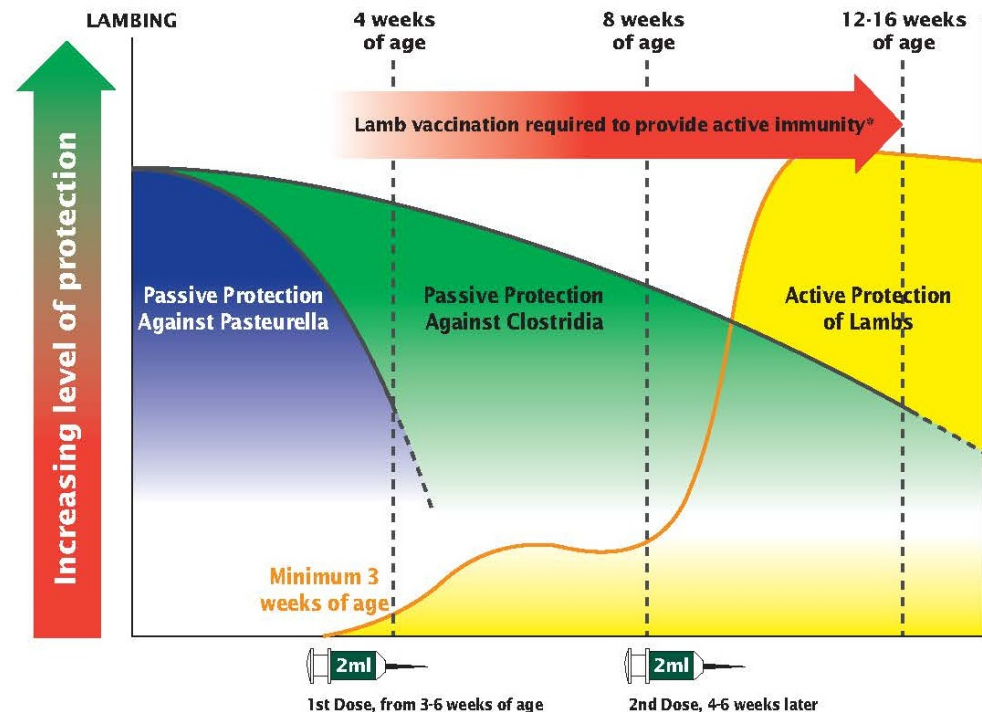
- Any lamb that has low chance of survival if left on ewe
- Lambs that cannot be cross-fostered
- Lack Colostrum

• Make decision
As soon as possible

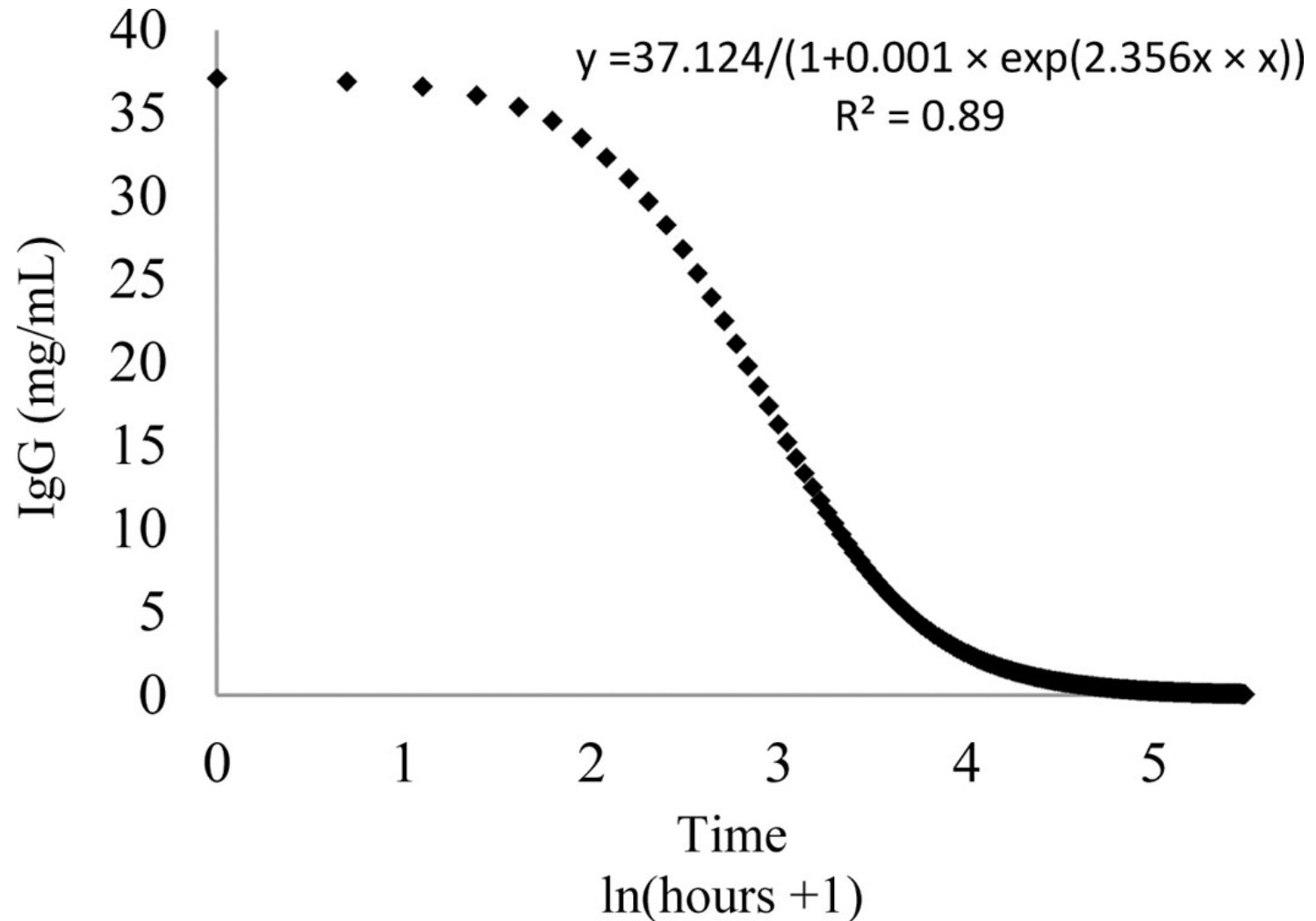


Colostrum

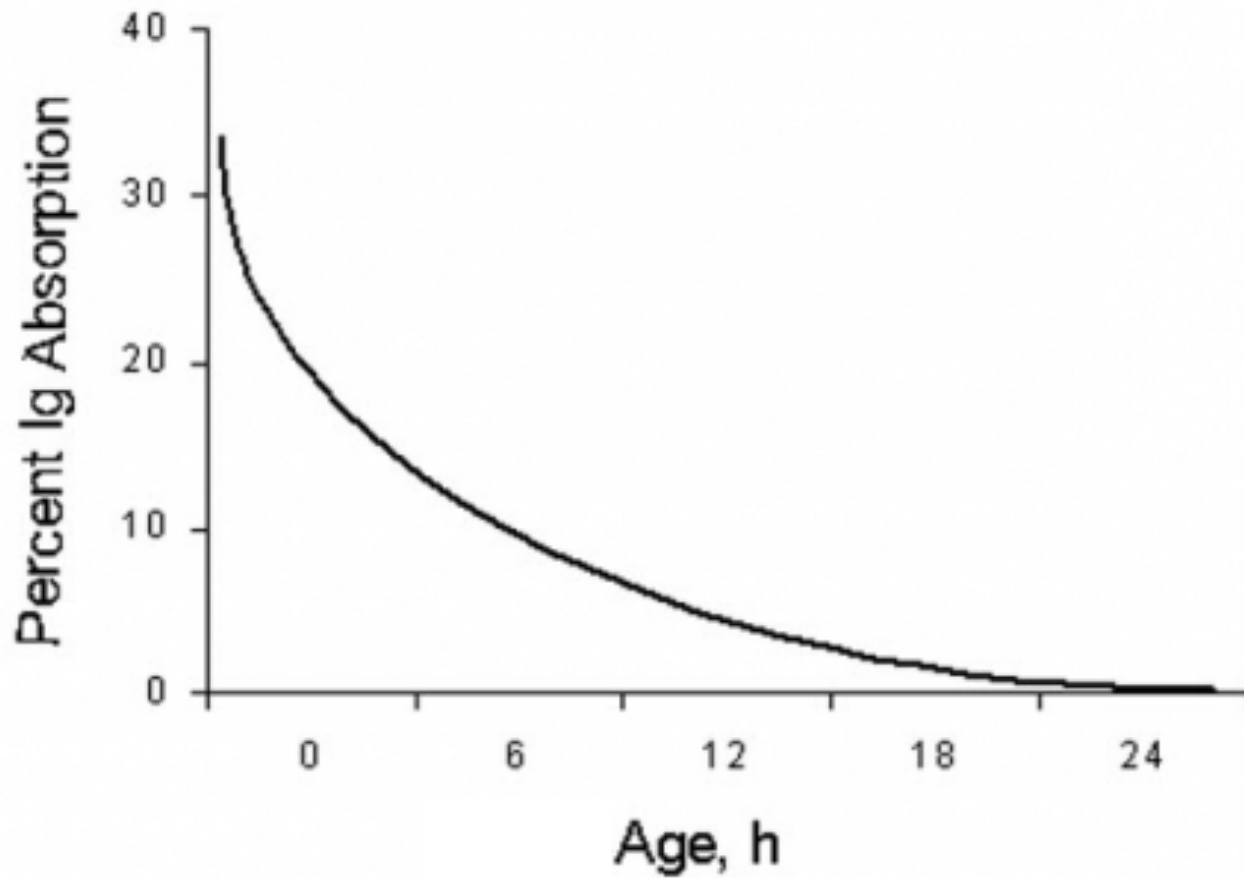
- Most important part of successful lamb rearing
- Timing is critical
 - 10% of body weight Within first 24 hours
- 4 feedings
 - 4 hour intervals



Colostrum



Colostrum



Sources of Colostrum

- Ewes Colostrum is ideal
 - Can be frozen and thawed
- Cattle or Goat
 - Lower nutrient value but contains Ig
 - Disease transfer is a risk
- Powdered Colostrum Replacer/
Supplement



Collecting colostrum
separately



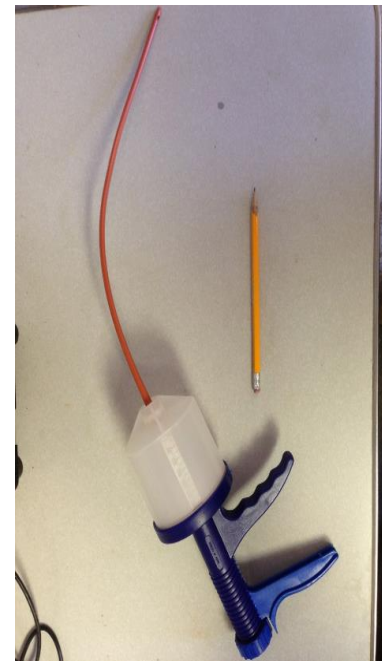
Measuring colostrum
quality



Feed colostrum at
107°F



Restraining a lamb









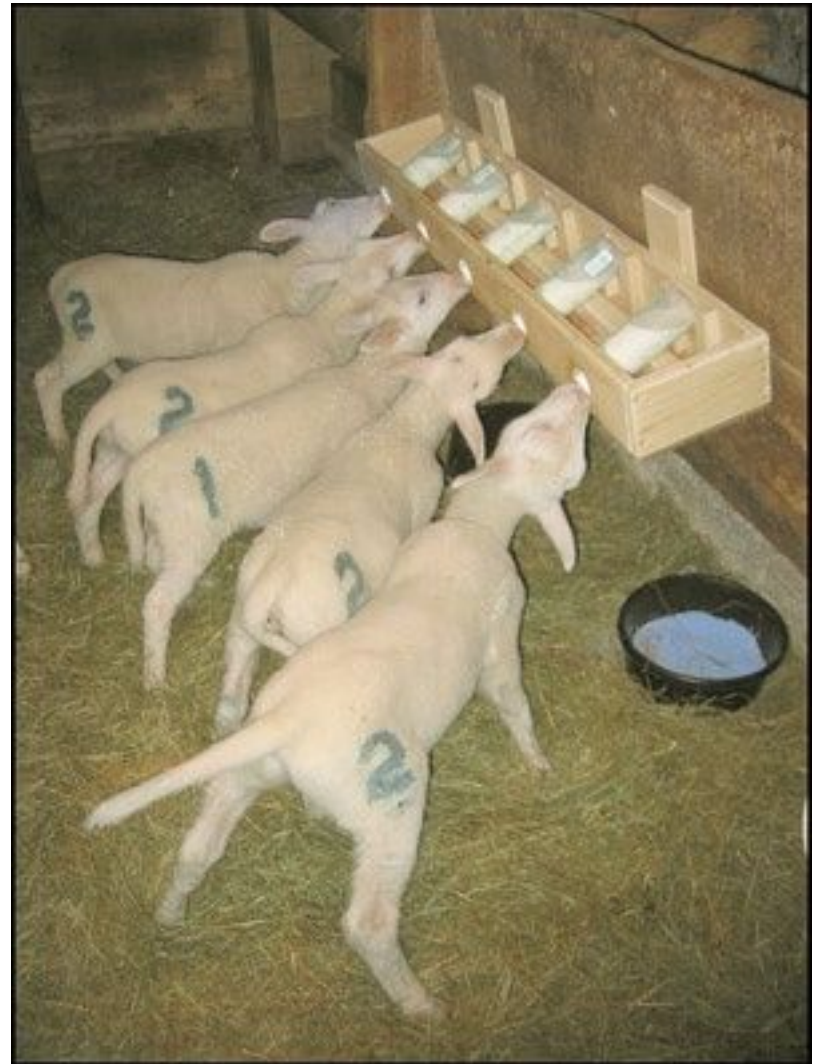
[illegible]

Transition to Milk Replacer

- After last colostrum feeding, lambs are processed.
 - Ear tag, docked, castrated
- Transferred to “training pen” (10-12 lambs/pen) to get accustomed to milk replacer feeders. Warm milk replacer.

Feeding Milk Replacer

- Bottles
- Lamb bar
- Automatic Feeders



Feeding Milk Replacer

- Milk replacer can be fed via bottle, but this is labor demanding when feeding many lambs.
- Furthermore, if lambs are bottle fed at intervals they usually gorge themselves.
- Simple solutions exist that better mimic natural feeding.



Tip: Feeding buckets that make the lamb work against gravity may prevent over-consumption.

Other Feeders



Shallow cake pan with heating lamp underneath warms milk replacer and encourages young lambs to quickly learn how to feed.

Once lambs have learned how to feed, deeper buckets can be used and milk replacer should be fed cold.



Automatic Feeders

- Automate mixing of milk replacer
 - Saves labor
- Ad lib access for lambs



Automatic Feeders

- Cost: \$2,072
- 120 lambs per feeder per year
 - \$17.27 / lamb
- 10 year lifespan, \$30/year maintenance
 - 1,200 lambs over 10 years
 - \$1.97 / lamb over lifetime of machine

Cleanliness is Key!

- Regardless of feeding method, feeders need to be thoroughly cleaned every 24 hours!
- Buckets, Nipples, Tubing need disassembled and cleaned in warm soapy water.
- Having an extra set of hoses and nipples speeds cleaning process.



Feeding Systems

- Having a feeding system/routine improves efficiency
- All lambs treated same manner
- Equipment is maintained consistently

Transition to Milk Replacer

- After last colostrum feeding, lambs are processed.
 - Ear tag, docked, castrated
- Transferred to “training pen” (10-12 lambs/pen) to get accustomed to milk replacer feeders. Warm milk replacer.
- Once lambs are trained, transfer them to “graduate pen”. Have pelleted feed (18% CP) available. Warm milk replacer. ~1 week
- Transfer lambs to group housing (8-10 lambs/nipple). Cold milk replacer.

Transition to Milk Replacer

- After last colostrum feeding, lambs are processed.
 - Ear tag, docked, castrated
- Transferred to “training pen” (10-12 lambs/pen) to get accustomed to milk replacer feeders. Warm milk replacer.
- Once lambs are trained, transfer them to “graduate pen”. Have pelleted feed (18% CP) available. Warm milk replacer. ~1 week
- Transfer lambs to group housing (8-10 lambs/nipple). Cold milk replacer.

A photograph of a large, rectangular wooden pen in a barn. The pen is filled with straw bedding. The walls are red and white, and there are windows on the right side. A white text box with the text "Graduate Pen" is overlaid on the image.

Graduate Pen

A photograph of several smaller wooden pens arranged in a row. Each pen is filled with straw bedding. A white text box with the text "Training Pens" is overlaid on the image.

Training Pens



Training pen
(above), graduate
pen (below)







Hoop barn with feeders



Automatic lamb feeders



Milk Composition by Species

Species	Component (%)		
	Fat	Protein	Lactose
Sheep	6.0	5.8	4.3
Cow	3.8	3.3	5.0
Goat	3.4	3.0	4.5

Milk replacer for calves (or kids) will be lower in fat and protein and higher in lactose than lambs need. Higher lactose content can cause scours in lambs.

Milk Replacer Composition

- At least
 - 25-30% fat
 - 25% lactose
 - 24% protein
- Less than .5% fiber
- Medicated
- Acidified to prevent spoilage
 - Increased intake, digestion, less scours

Weaning

- An average lamb will consume about 18 pounds of milk replacer from birth until weaning at ~30 days.
 - Over half (10 lbs) is consumed in the last 10 days before weaning
- Lambs can be weaned earlier than 30 days.
 - Make sure they weigh ~30 pounds when weaned
- Wean lambs abruptly, do **not** water down the milk replacer.
- Lambs with ewes on pasture normally start ruminating at 30-40 days.
 - Keep hay out of the starter diet for the first 50 days

Lamb performance

		Trait	
Effect	Level	30d Wean Wt (lbs)	ADG (lbs d ⁻¹)
Dam Age	2	31.4 ± 0.54	0.63 ± 0.02
	3	32.2 ± 0.54	0.66 ± 0.02
	4+	32.6 ± 0.54	0.67 ± 0.02
Birth Type	Single	33.0 ± 0.57	0.66 ± 0.02
	Multiple	31.1 ± 0.52	0.65 ± 0.02
Sex	Ewe	31.4 ± 0.53	0.65 ± 0.02
	Ram/wether	32.7 ± 0.53	0.67 ± 0.02
Sire Type	Dairy	30.4 ± 0.53	0.62 ± 0.02
	Terminal	33.7 ± 0.54	0.70 ± 0.02

Artificial Rearing Economics

Category	Cost/Return
Milk replacer lamb ⁻¹	18 lbs x \$2 lb ⁻¹ = \$36
Labor lamb ⁻¹	0.5 hr x \$10 hr ⁻¹ = \$5
Supplies lamb ⁻¹	\$0.75
Dry feed lamb ⁻¹ (birth to 60 lbs)	130 lbs x \$320 ton ⁻¹ = \$20.80
Automatic Feeder	\$1.97 lamb ⁻¹
Total cost lamb ⁻¹	\$64.52
Total return lamb ⁻¹	60 lbs x \$1.60 lb ⁻¹ = \$96
Profit lamb ⁻¹	\$31.48

Summary

- Artificial rearing of lambs can be cost effective
- Start with healthy lambs
- Efficient, consistent system
- Automate when possible

Artificial Lamb Rearing: Transitioning from nuisance to potential profit center

Presenter:

**Russell Burgett, Program Director
National Sheep Improvement Program**



Host/Moderator: Jay Parsons

March 3, 2020



This webinar is made possible with funding support from the Let's Grow Committee of the American Sheep Industry Association.