

Highlights from the Leading Edge Project

Presenter:

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Host/Moderator: Jay Parsons

September 24, 2019



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

This evening's talk

➤ Objectives of the project



➤ What we did and learned

- Ram selection
- Breeding
- Lambing
- Weaning
- Finishing
- Harvest



Grate ful to sp o nso rs



AMERICAN SHEEP INDUSTRY ASSOCIATION
YOUR INDUSTRY ADVOCATE SINCE 1865



NSIP

National Sheep
Improvement
PROGRAM



Objective

- Building on a foundation
 - In 2016 study, demonstrated a 3 lb. advantage in weaning weight in lambs sired by NSIP rams





Objective

- Extend on original study to:
 - Compare rams from distinctive categories (NSIP and industry)
 - Evaluate their progeny's performance from birth to harvest
 - Incorporate DNA technologies

Ram selection (May to Oct. 2017)

➤ 42 Suffolk rams

- 15 **industry** rams
- 13 NSIP high post-weaning body **weight** rams
- 14 NSIP high post-weaning **muscle** depth rams



NSIP rams' expected progeny differences (EPD)

Record	Ram category	Weight EPD (lb.)		Ultrasound EPD (mm)	
		Weaning	Post-weaning	Muscle depth	Fat depth
At selection (Aug. 2017)	Weight	5.4	10.3	-0.01	-1.36
	Muscle	2.0	3.9	2.61	-1.17
	Difference	3.4	6.4	-2.62	-0.19
Recently (July 2019)	Weight	4.7	9.3	0.01	-1.37
	Muscle	1.5	3.1	2.57	-1.14
	Difference	3.2	6.2	-2.56	-0.23

Breeding (Nov. 2017)

- Michael Brothers Sheep Co. (Spring City, UT)
- 1,100 commercial white-faced ewes
- 17 day breeding on regrowth alfalfa stubble



Lambing (April 2018)

- 1,491 lambs born from 879 ewes over a 3-week period
 - 1.69 lamb per ewe lambing
- Shed lambed
 - Allowed fostering
- Near birth
 - Weighed
 - Tagged (EID)



Parentage (sire)

- A DNA sample was collected
 - on rams prior to breeding



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- A DNA sample was collected
 - on rams prior to breeding
 - on lambs near birth



Parentage (sire)

- Up to 163 genetic markers on DNA panel
- Assignments based on **exclusion** of sires
 - Key that full suite of potential sires are included

Animal	Marker 1	Marker 2	Marker 3
Lamb	AB	AA	BB
Sire 1	BB ✓	AA ✓	AB ✓
Sire 2	AA ✓	AB ✓	AA

(Heaton et al. 2014)



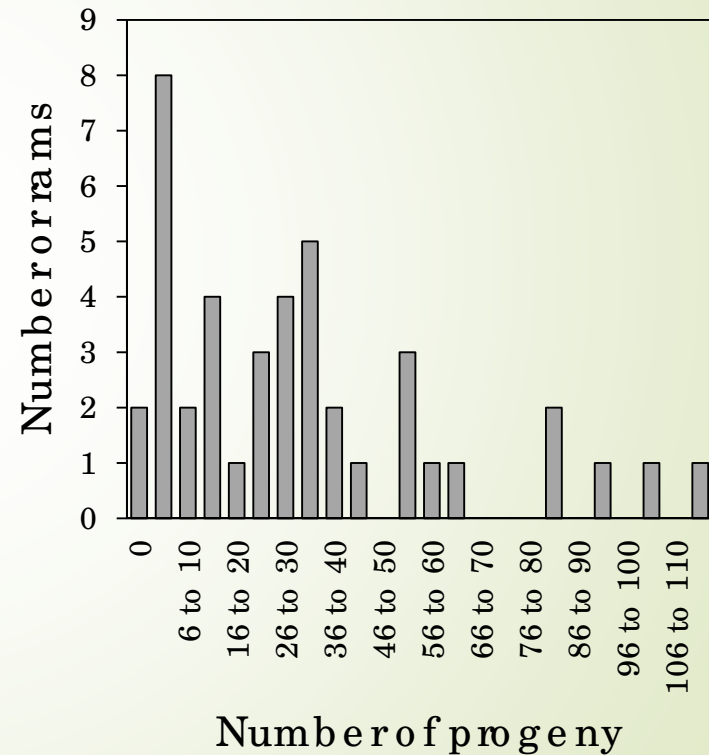
Parentage (sire)

- Up to 163 genetic markers on DNA panel
- Assignments based on exclusion of sires
 - Key that full suite of potential sires are included
- Among 1,457 lambs with a DNA sample, 92% aligned with a sire
 - Nearly all losses were lab based (quality control; heterozygosity rate)

(Heaton et al. 2014)

Number progeny per ram

- Considerable variation in number of lambs sired by individual rams

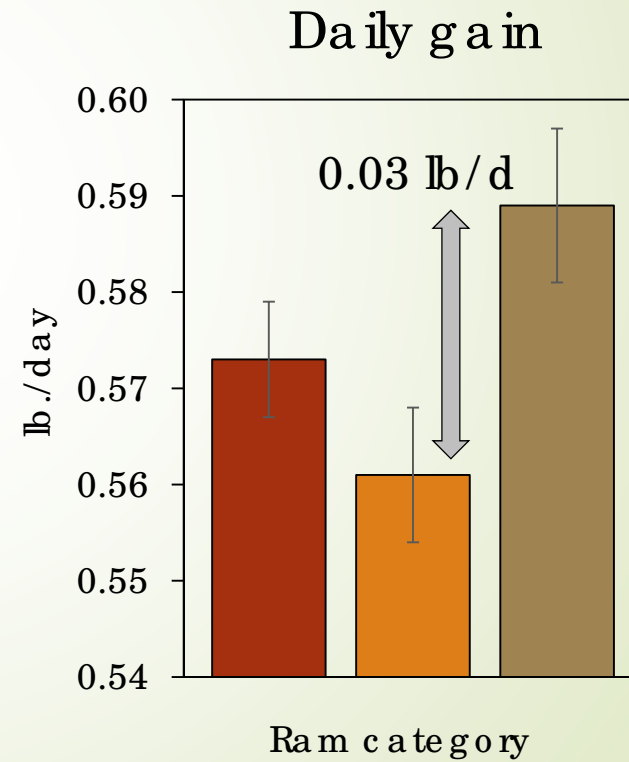
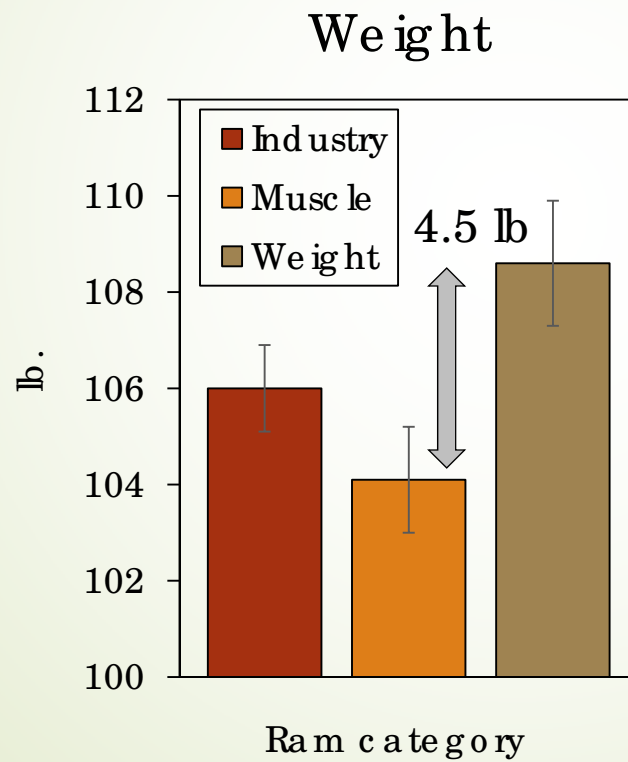


Weaning (Sept. 2018)

- Grazed in mountains
 - Dry summer
- 1,104 lambs weighed in 4 hr.
 - Used Shearwell EID Weigh Crate
 - 1.26 lamb per ewe lambing



Weaning performance





Genetic differences in weaning weight

Category	Weight EPD (lb.) recently [†]		Progeny weaning weight (lb.) [§]
	Weaning [‡]	Post-weaning [‡]	
Weight	4.6	9.2	108.6
Muscle	1.9	4.2	104.1
Difference	2.6	5.0	4.5

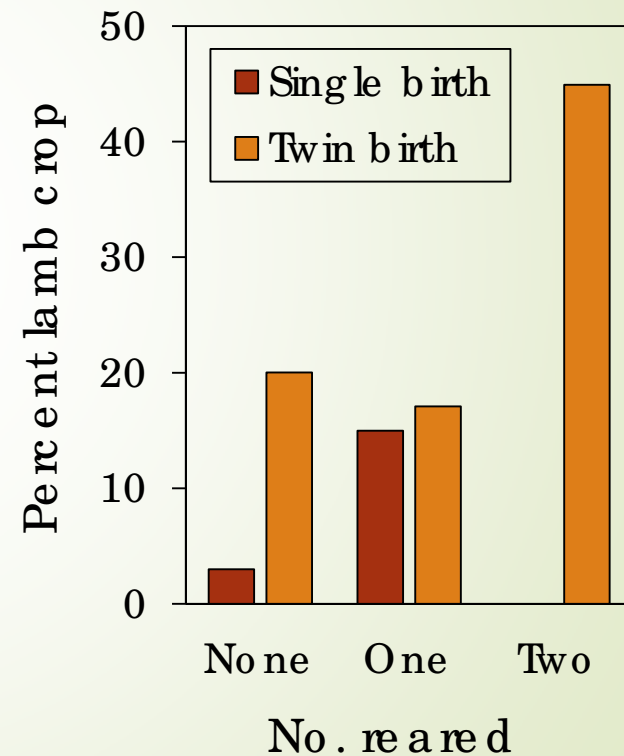
[†] EPD from July 2019, weighted by the number of lambs with a wean weight from each ram.


[‡] Weaning and post-weaning weights recorded at 45 to 90 and 90 to 150 days, respectively.

[§] At, on average, 161 days of age.

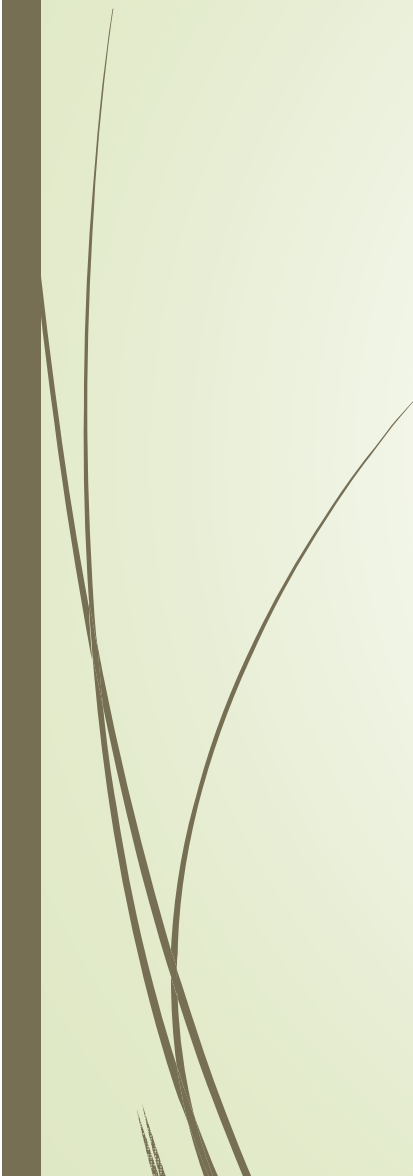
Lamb birth and rearing type effects on weight weaned

Birth-rearing type	Single-Single	Twin-Single	Twin-Twin
Indiv. wt. (lb.)	113.9	106.0	98.7
Litter wt. (lb.)	113.9	106.0	197.4

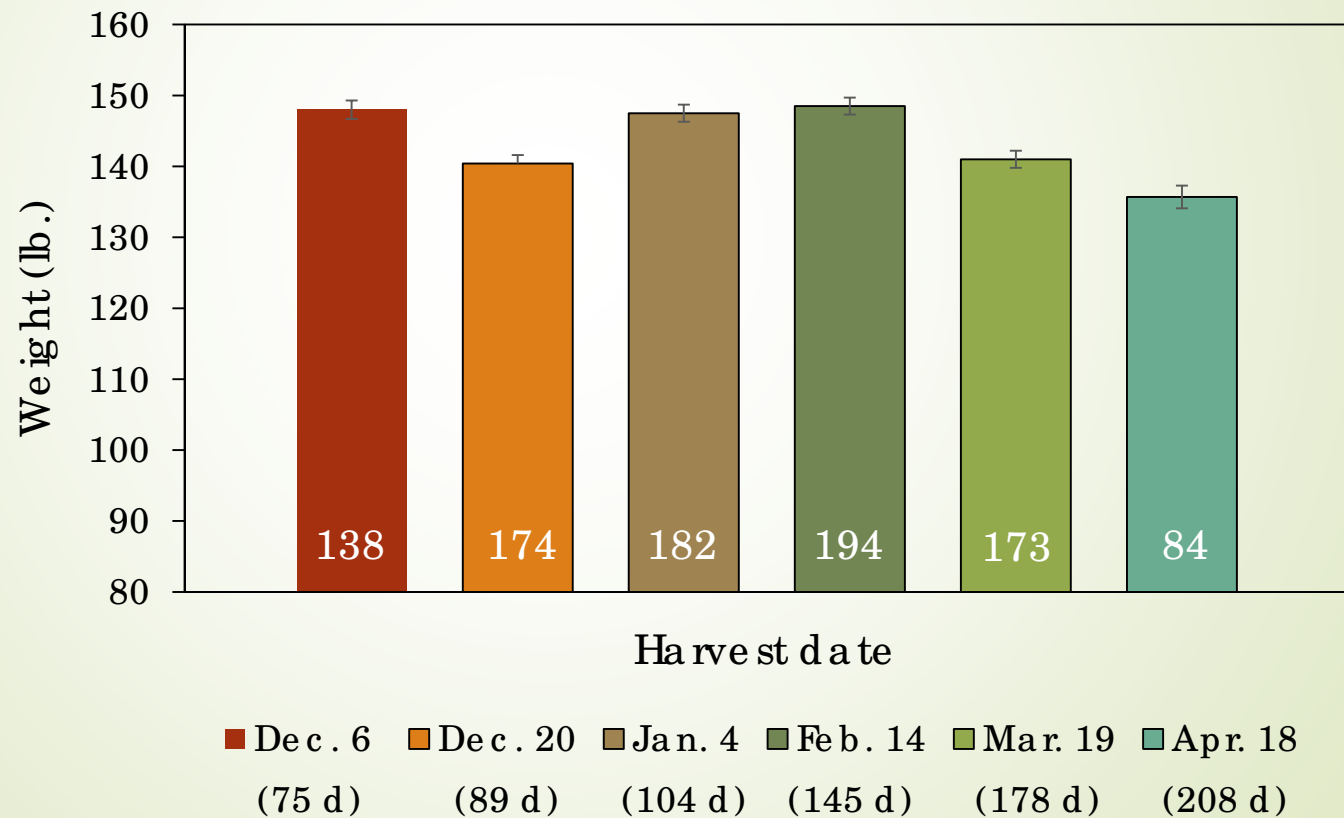




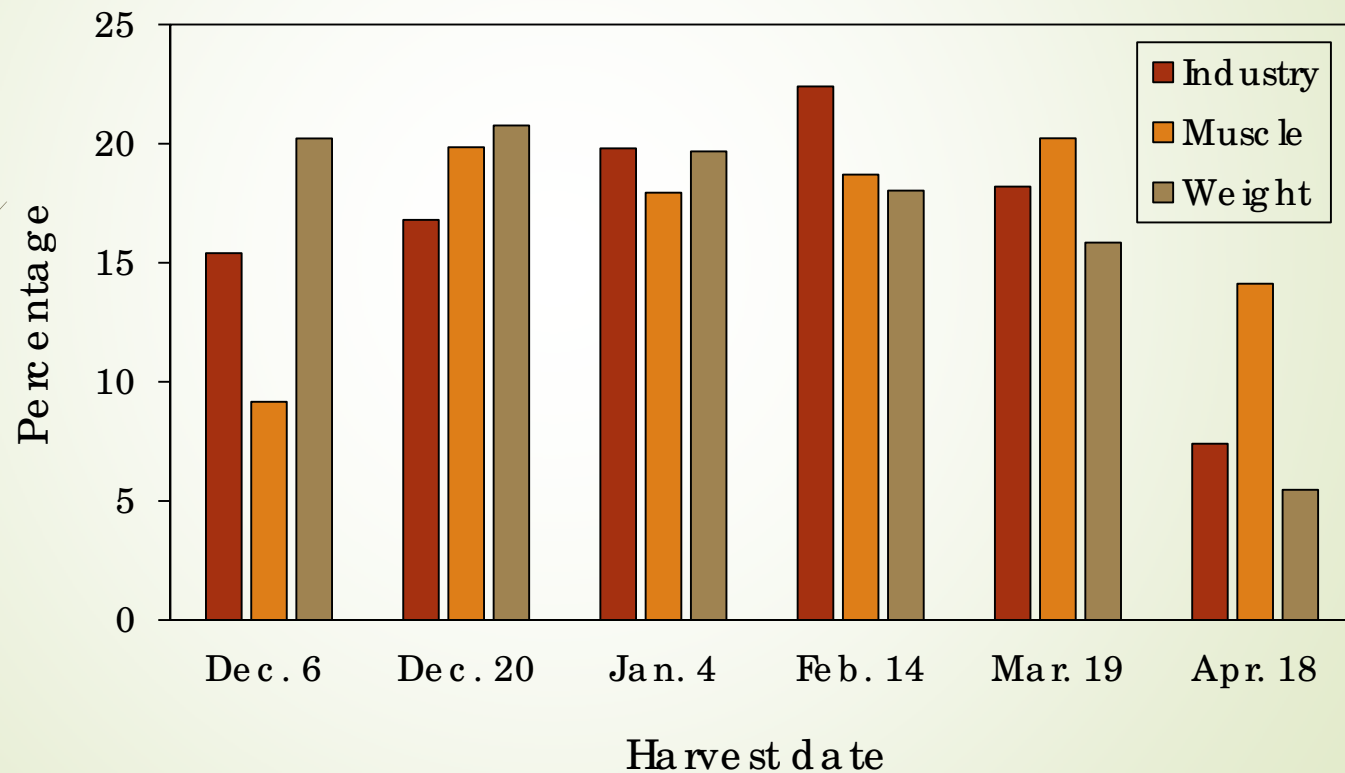
Finishing (Sept. 2018 to Apr. 2019)


- Shipped to Arthur Feed Lots for finishing (Burley, ID)
 - Fed to a similar weight and target condition
 - Drafted in 6 batches
- 

Finished weights



Spread of ram category by harvest date





Harvest (Dec. 2018 to Apr. 2019)

- Lambs shipped to Superior Farms for slaughter (Dixon, CA)
- Comprehensive carcass evaluation
 - Electronic grading (VSS2000 System camera) of yield and quality grades
 - Carcass weights
 - Other carcass measurements



Harvest Date ?	2018/12/20
Species ?	Lamb ABF
Program ?	ABF
Lot No ?	401
HotWeight ?	70.9
Yield Grade ?	2.490000
Quality Grade ?	Choice

Occ ?	46.90
Occ_Yield_0 ?	66.78
Breast ?	8.7
Rack ?	8.4
Shoulder ?	17.5
Legs ?	23.6
Loins ?	7.4
Neck ?	1.7
Trotters ?	3.1

Harvest Date

Lot#

Serial#



Twin Bo m Ewe
Lamb

BW 14lbs

WW 110.23

168 days of age
at weaning

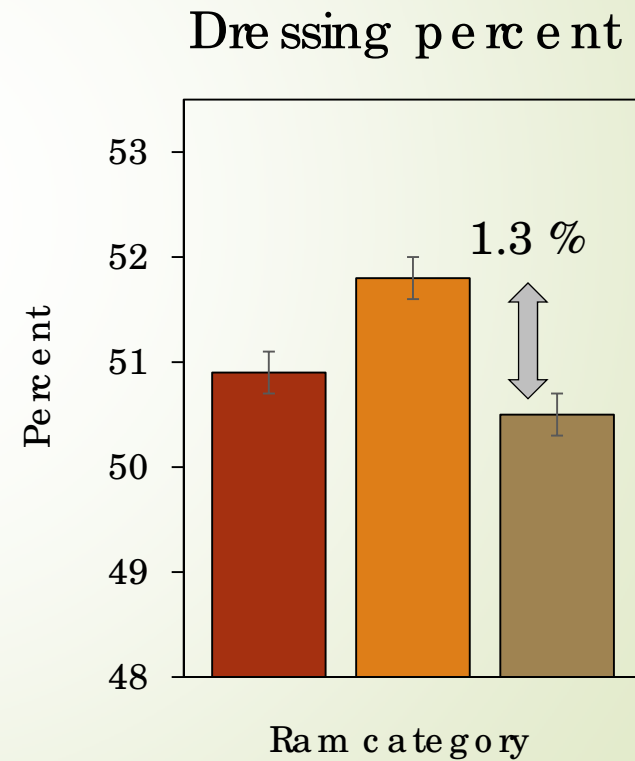
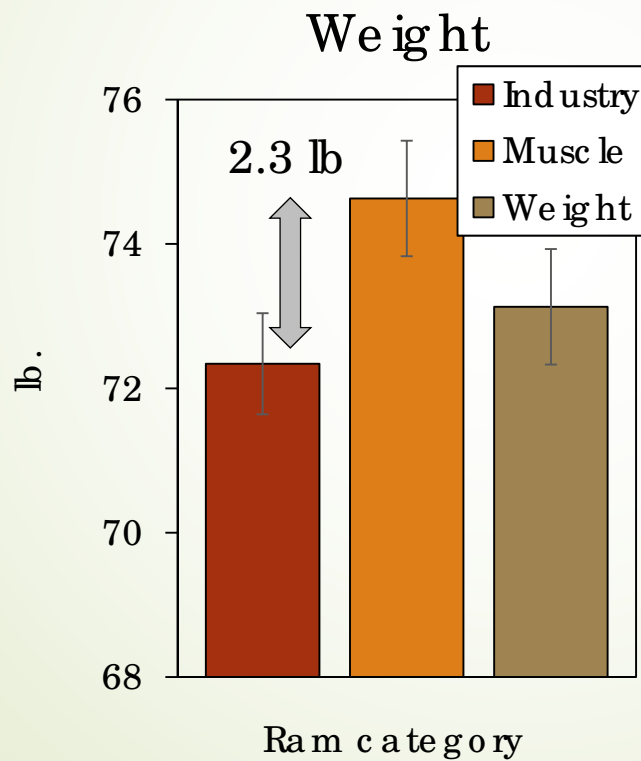
135.58 Live Wt.

70.9 Hot Weight
52.29 Dressing %

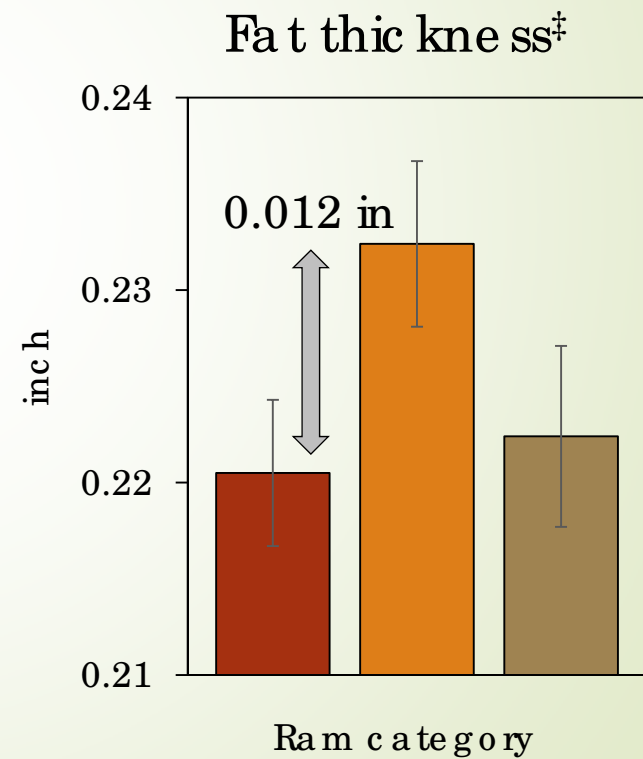
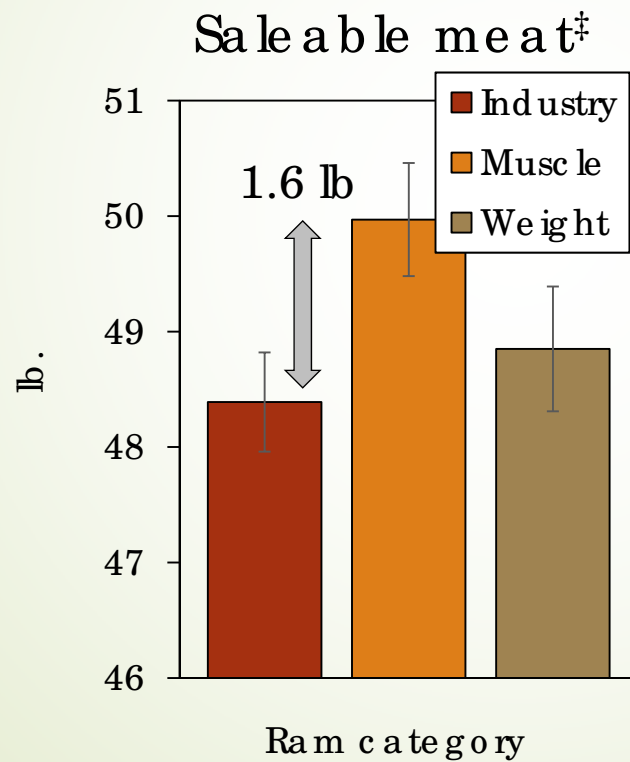
89 days on feed

0.285 ADG

Hot carcass weight and dressing percent



Hot carcass weight and dressing percent



[‡] Electronic grading



Summing up

- Progeny of NSIP-sired rams performed as anticipated based on sire's genetic merit
 - +4.5 lb. weaning weight in high weight
 - ❖ Worth +\$6.39 to +\$7.25/lamb (feeder price)
 - +1.1 lb. saleable meat yield in high muscle
- On average, progeny of industry rams performed intermediary to or less than muscle/weight NSIP rams



Summing up

- With DNA sample on sires and lambs, able to reliably assign parentage
- Tremendous opportunity to increase output by producing and rearing twin born lambs
- Variability in ram fertility troubling



Some further steps

- Complete carcass measures
 - Lo in eye areas, fat depth and skin thickness
- Provide rams' owners with details on their own animals
- Share results more widely
 - Webinar
 - Industry article(s) and pamphlet
 - Journal article(s)



Thank you!

► Project team

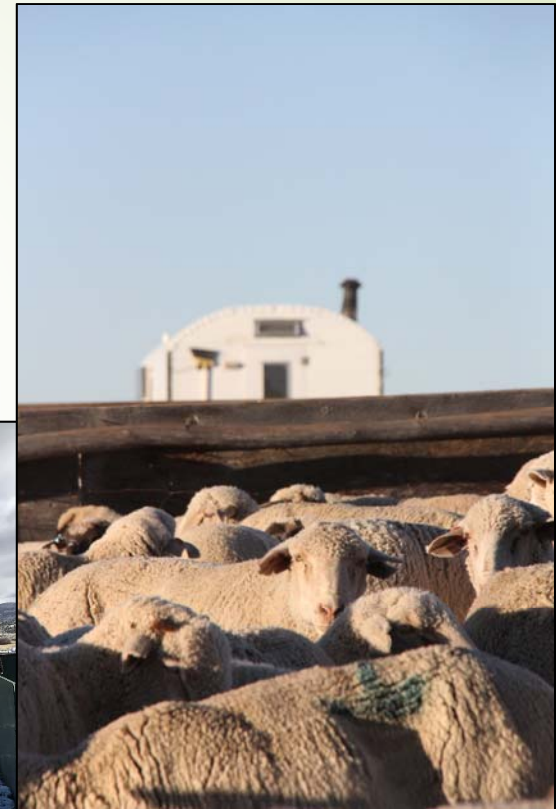
- Tom Boyer
- Rusty Burgett
- Kim Chapman
- Alan Culham
- Lesa Eidman
- Matt & Dan Mickel
- Bill & Susan Shultz



Mickel Brothers
Sheep Co.
Arthur Feed Lots

Thank you!

Questions?



Photos:
Kyle Partain