Profitable Genetic Selection:

How the National Sheep Improvement Program Can Help the US Sheep and Goat Industry

Presenter:

Dr. Reid Redden

Extension Sheep Specialist and NSIP Chairman

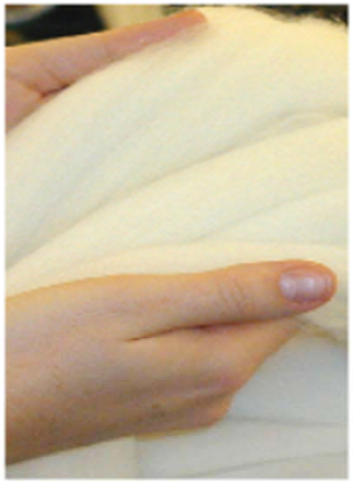
North Dakota State University

Host/Moderator: Jay Parsons

December 17, 2013

This webinar is being offered in cooperation with the American Sheep Industry Association Rebuild the Sheep Inventory Committee.

ASI/NLFA ANNUAL CONVENTION



Charleston, South Carolina

JANUARY 22-25, 2014

For more information, go to www.sheepusa.org

National Sheep Improvement Program

"A Profit Driven Genetic Selection Tool"

National Sheep Improvement Program

"If you like your show sheep,
you can keep your show sheep!"

National Sheep Improvement Program

- Additional Technology, not Substitution
- Improve Decisions, not Change
- Market Quantitative Data, not Qualitative
- Facilitate Collaboration (Apples to Apples)
- Initiate Profitable Measurements

Objectives for Goal 3 – Productivity Improvement

1. Promote widespread producer use of quantitative genetic selection

2. Reduce the seasonality of the lamb industry

3. Develop a long-term plan for U.S. sheep research and producer education

4. Develop industry-wide production metrics to measure productivity

NSIP Webinar Outline

- Past, Present, and Future of the Program
- Other Quantitative Genetic Programs
- Success Stories of the Program
- Nuts and Bolts
- Questions

Past, Present, Future

- Past
  - Non-profit formed by the Sheep Industry in 1980s
  - Developed EPDs
  - Transitioned to Sheep Genetics (LambPlan)
    - EBVs = EPD x 2
    - Software
    - Reports Twice a Month

Past, Present, Future

- Present
  - NSIP Office
    - Mary Sorenson
  - Board of Directors
    - Chairman – Reid Redden
    - Vice Chairman – Cody Hiemke
    - Secretary – Mary Langhus
    - Treasurer – Jack McRae
    - Technical – Dave Notter
    - Advisor – Rodney Kott

Past, Present, Future

- Present
  - Board of Directors
    - Polypay – John Carlson
    - Suffolk/Dorset – Alan Culham
    - Katahdin – Carl Ginapp
    - Hampshire – Dan Morrical
    - Tracie Roeder – Targhee
    - Dan Waldron – Rambouillet
    - Jim Morgan – At Large

Past, Present, Future

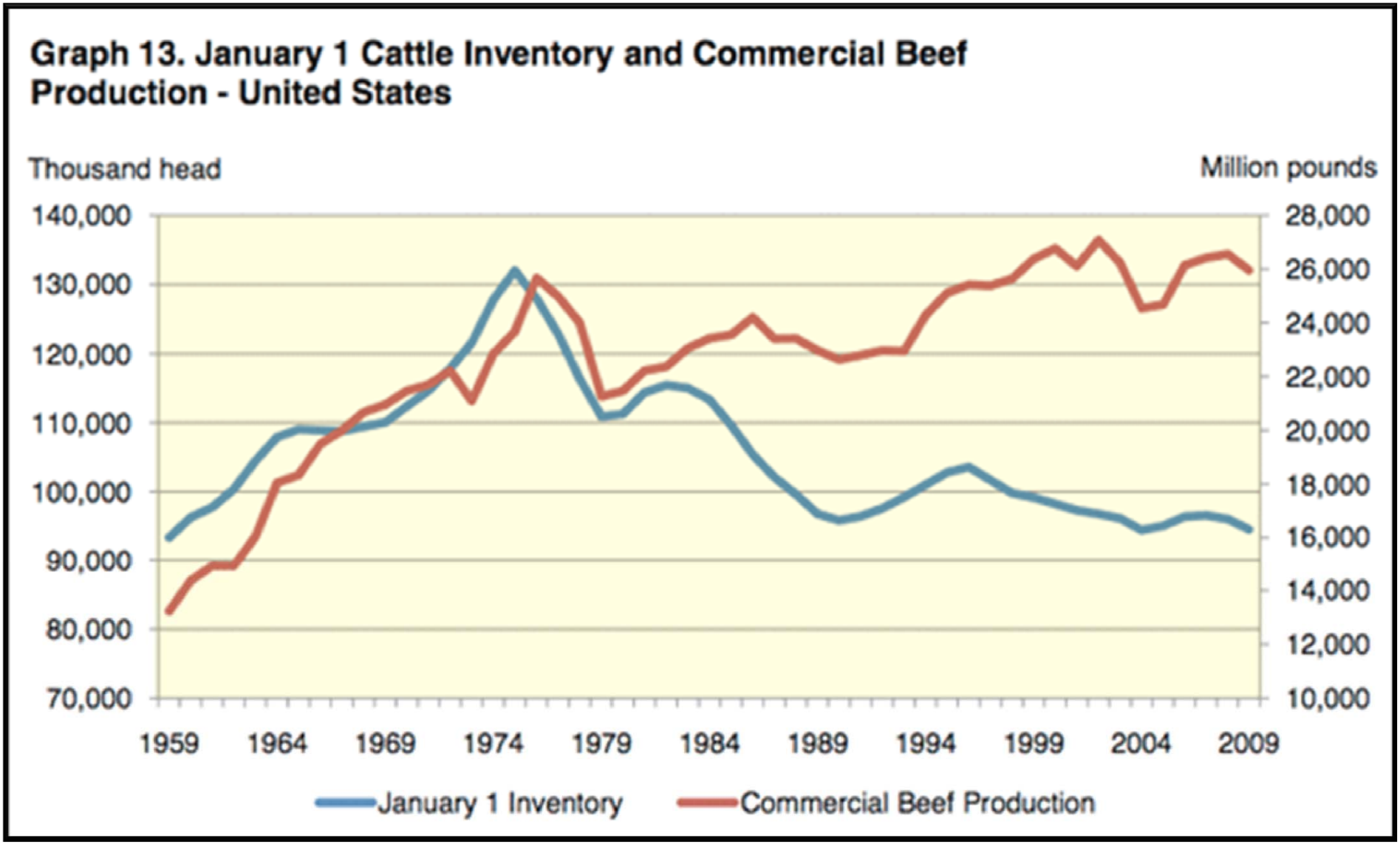
- Present
  - 20 Breeds
  - 150 Flocks
  - 10,000 sheep
  - Currently, the lack of acceptance of this technology has put our industry at a competitive disadvantage to foreign competition and other sources of food and fiber

Past, Present, Future

- Future
  - 50% or greater seedstock sheep breeders
  - 50% or greater commercial buyers using EBVs
  - Active group of meat goat breeders

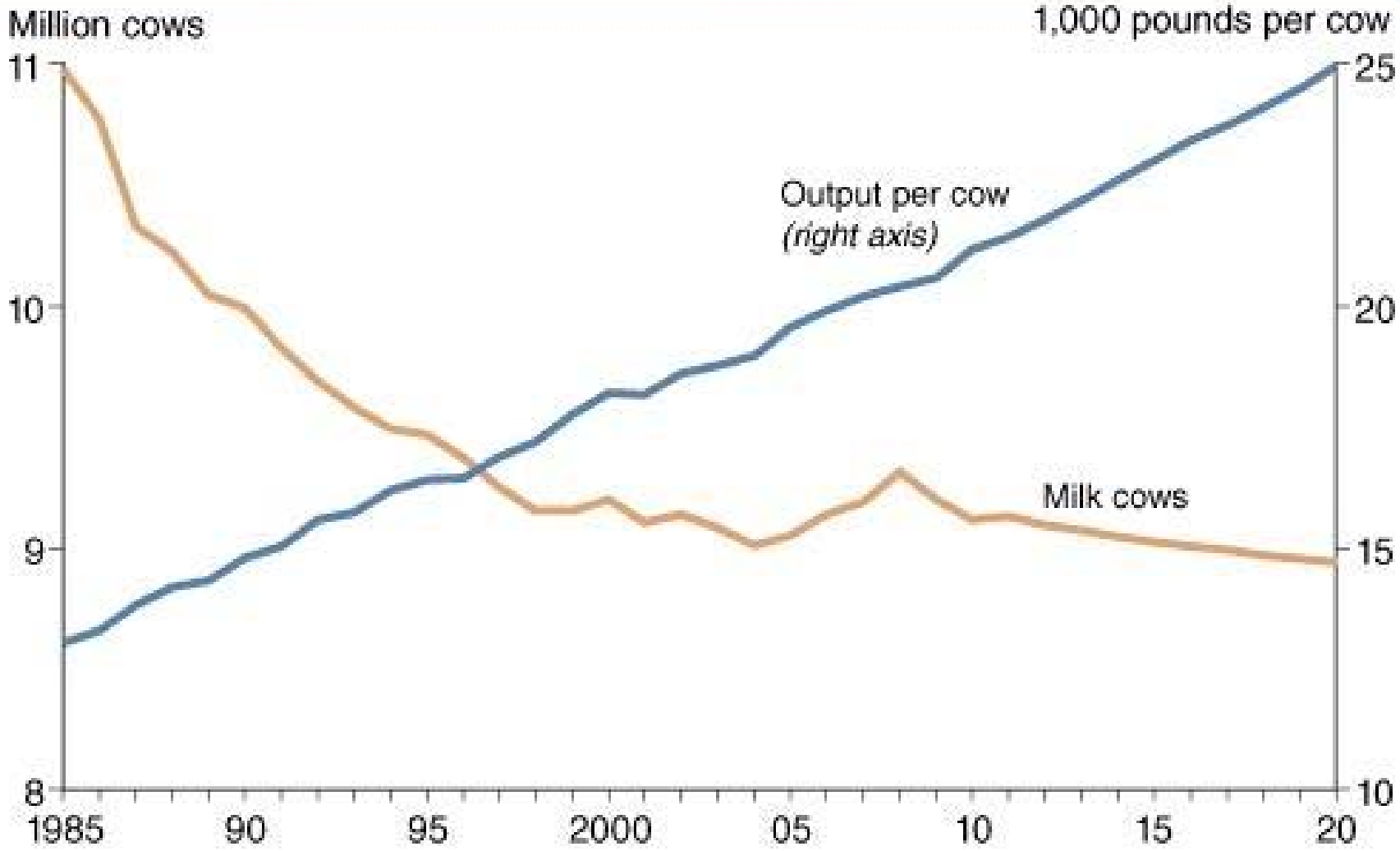
Beef Cattle

- Ground work for EPD were done in the 1970s
- Commercial acceptance of growth data started in the 1980s


Graph 13. January 1 Cattle Inventory and Commercial Beef Production - United States
Thousand head
Million pounds
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
28,000
26,000
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
1959
1964
1969
1974
1979
1984
1989
1994
1999
2004
2009
January 1 Inventory
Commercial Beef Production

USDA, NASS

U.S. dairy herd and milk production per cow



Source: USDA, Economic Research Service using USDA Agricultural Projections to 2020.

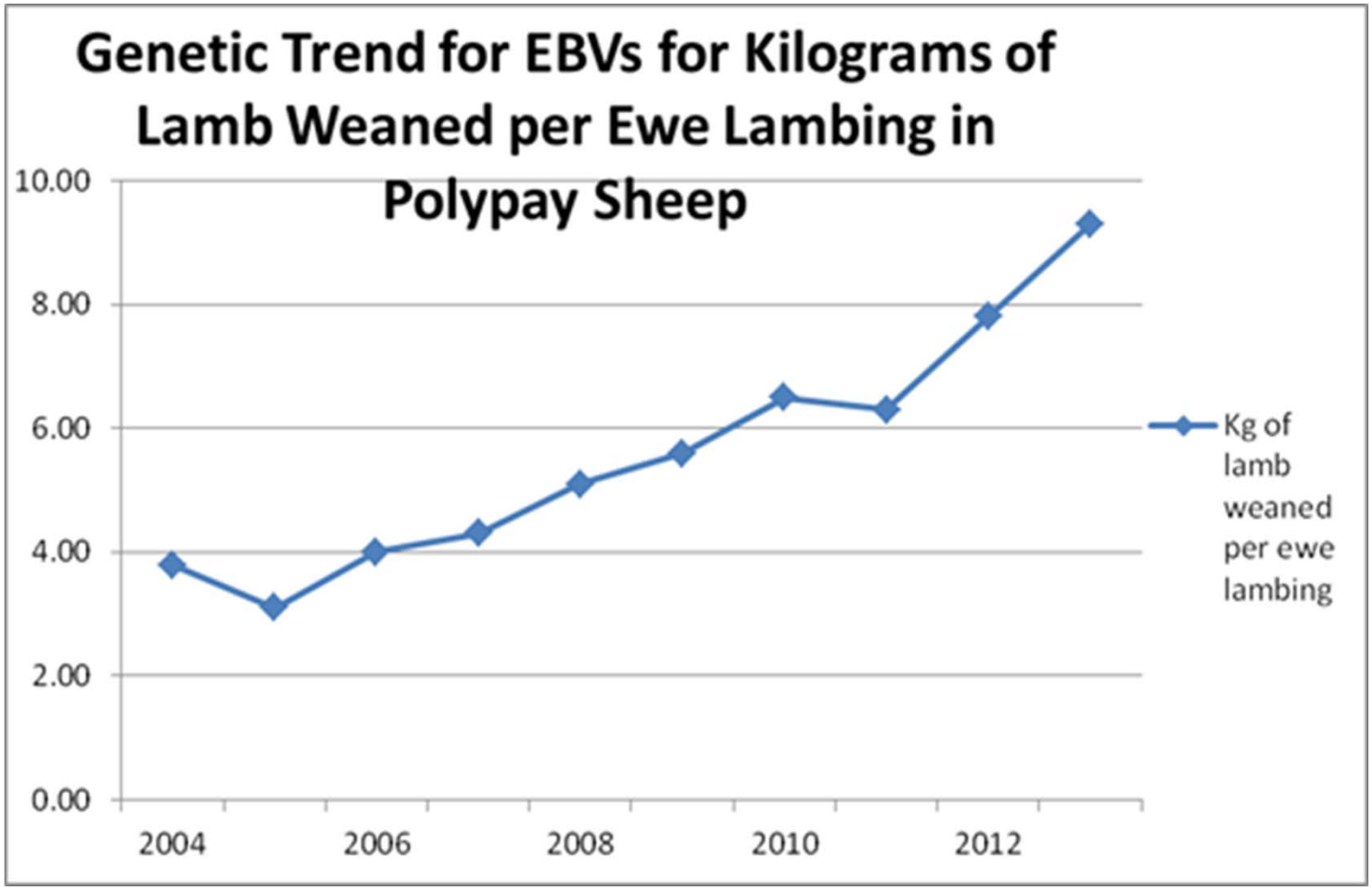
US Consumption and Supply of Lamb

We need to produce more lamb with less ewes!

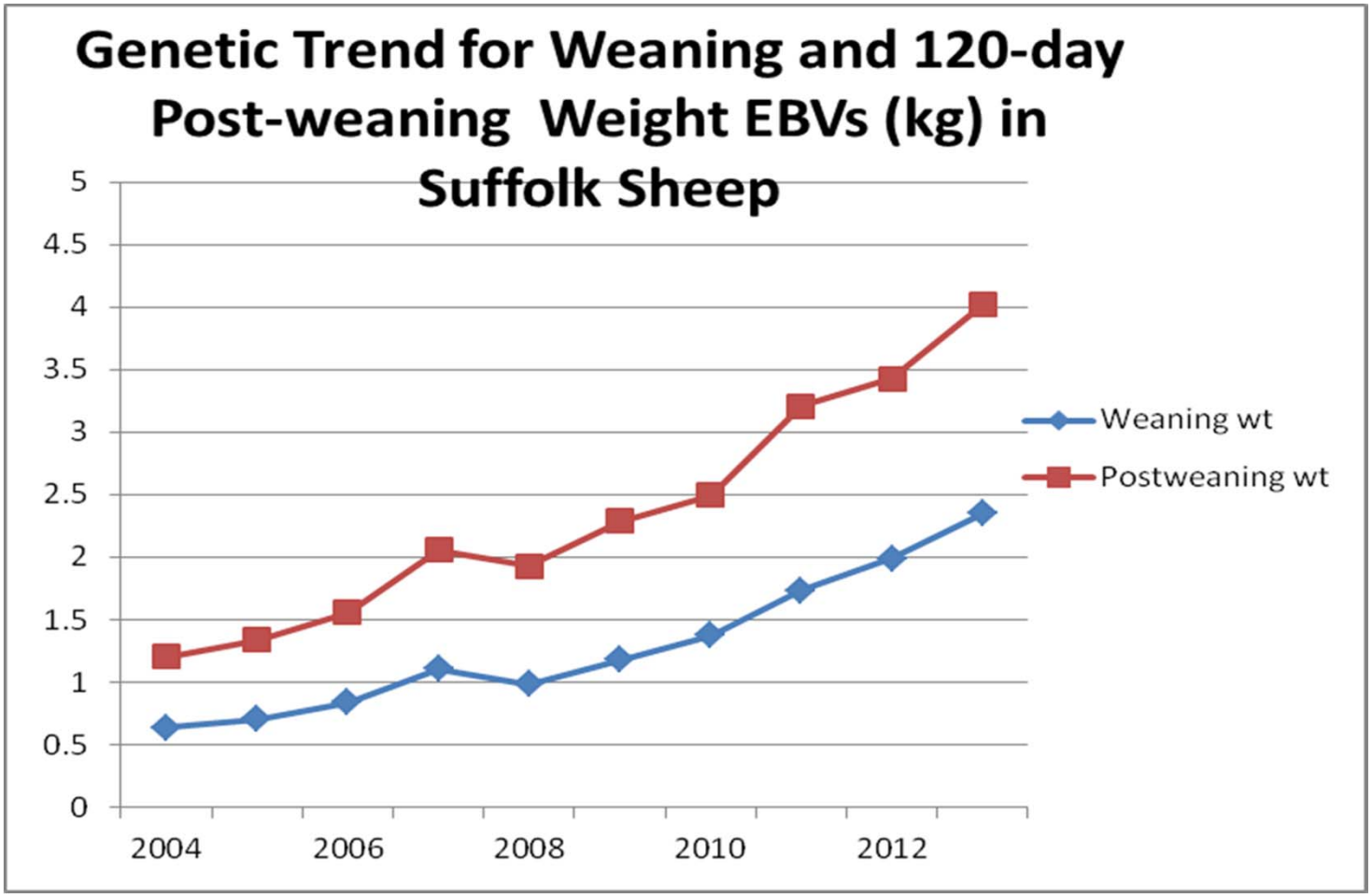
NSIP can help the industry accomplish this goal!

Source: USDA, Economic Research Service

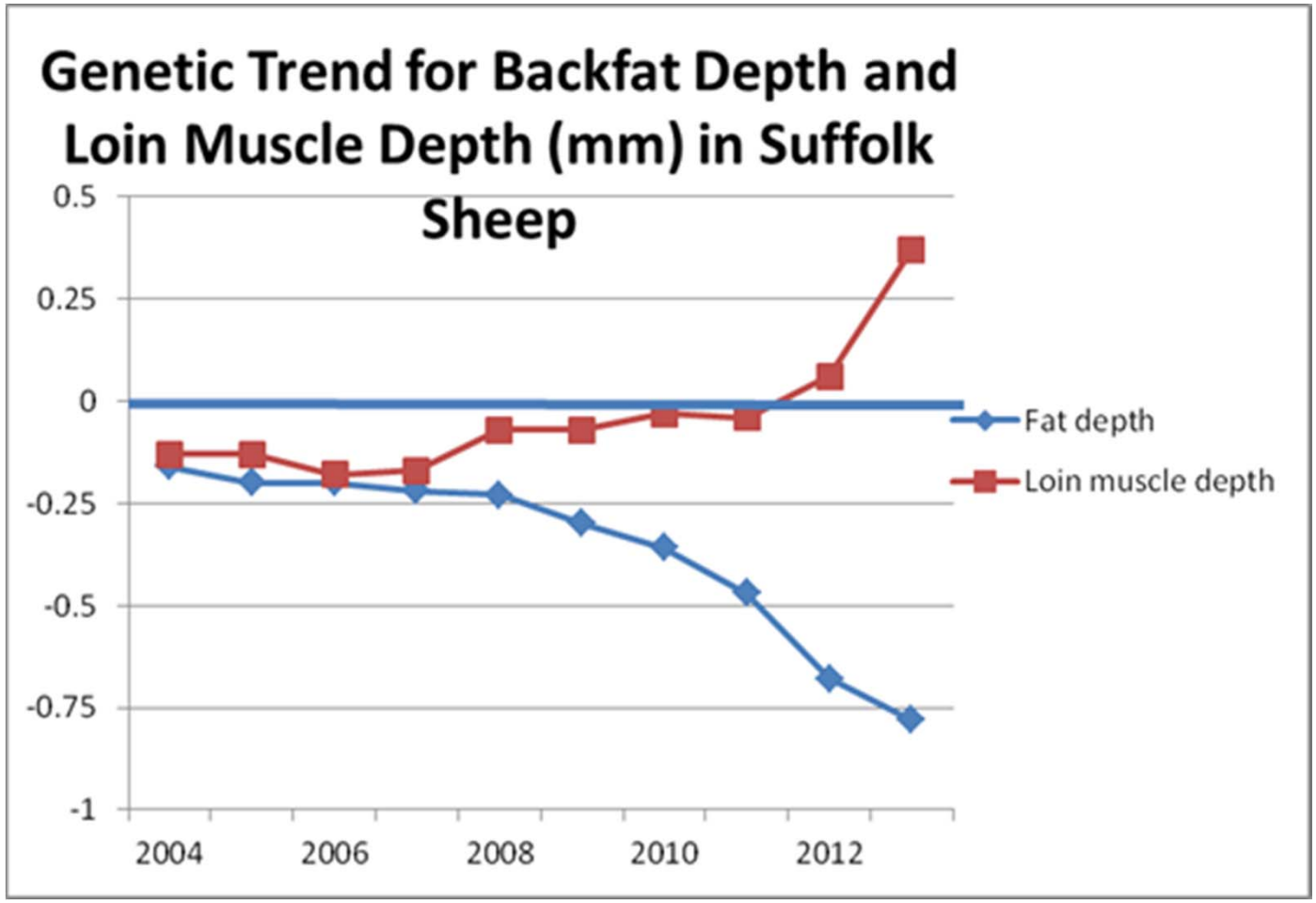
NSIP Success Stories



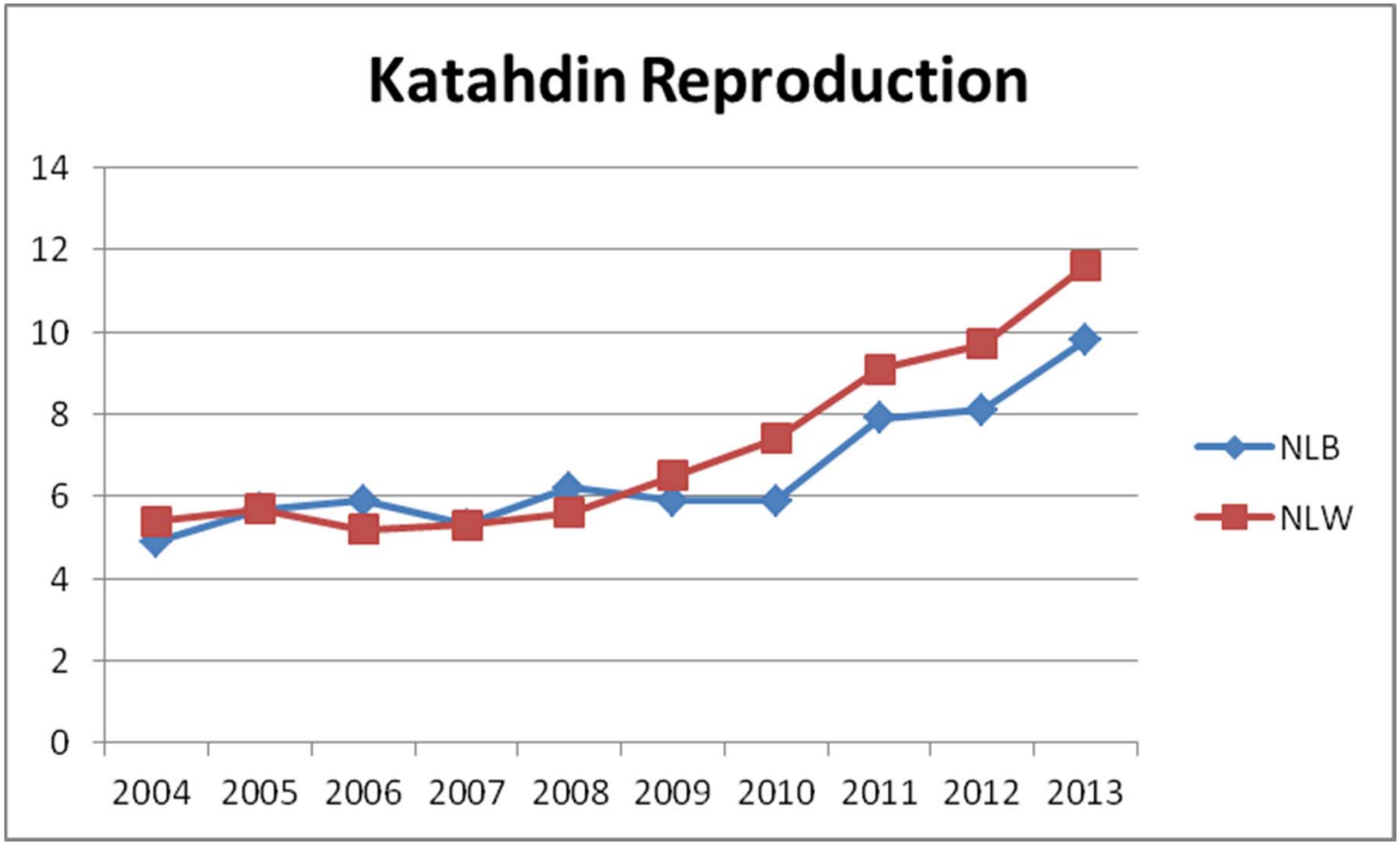
NSIP Success Stories



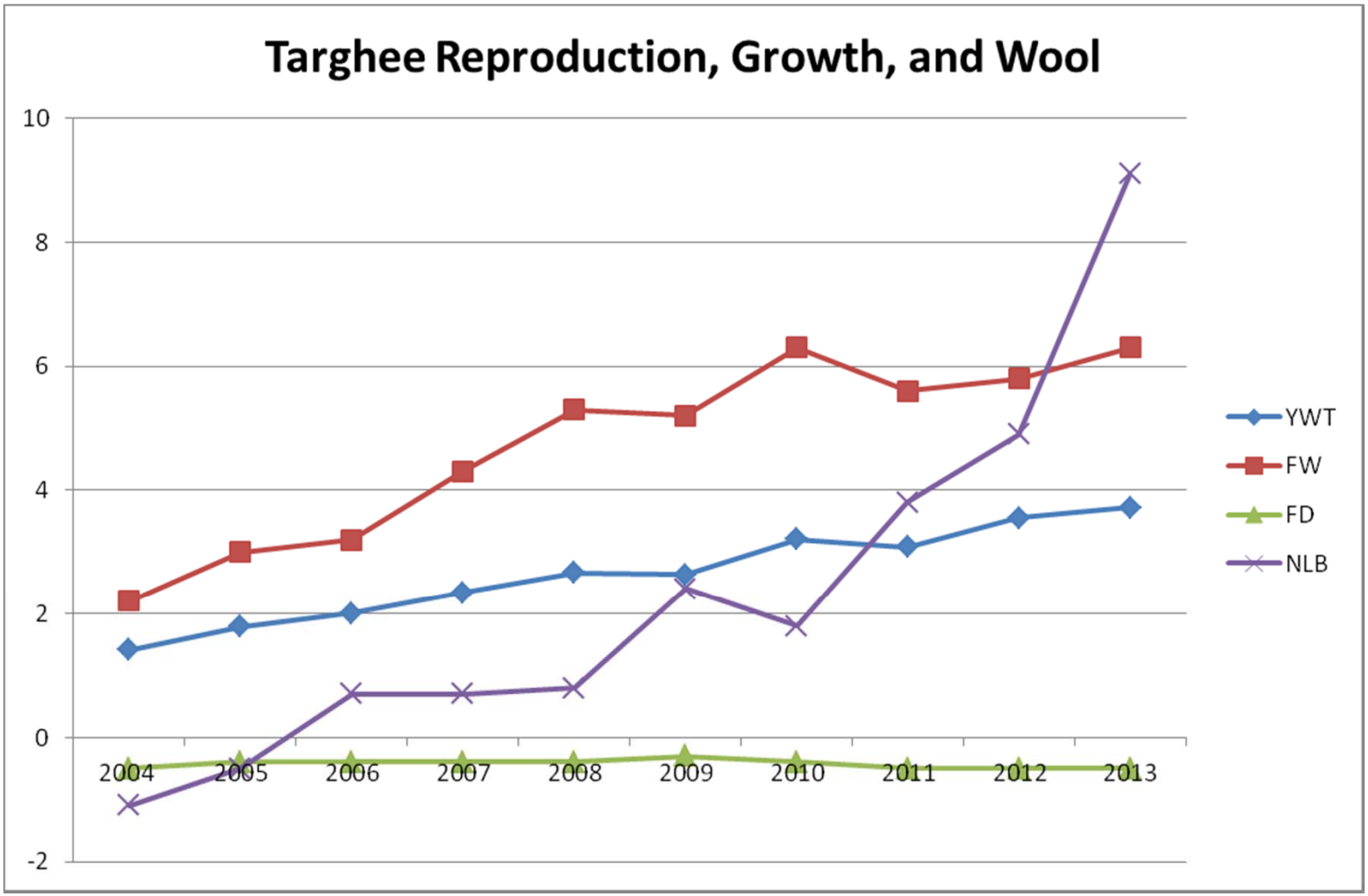
NSIP Success Stories

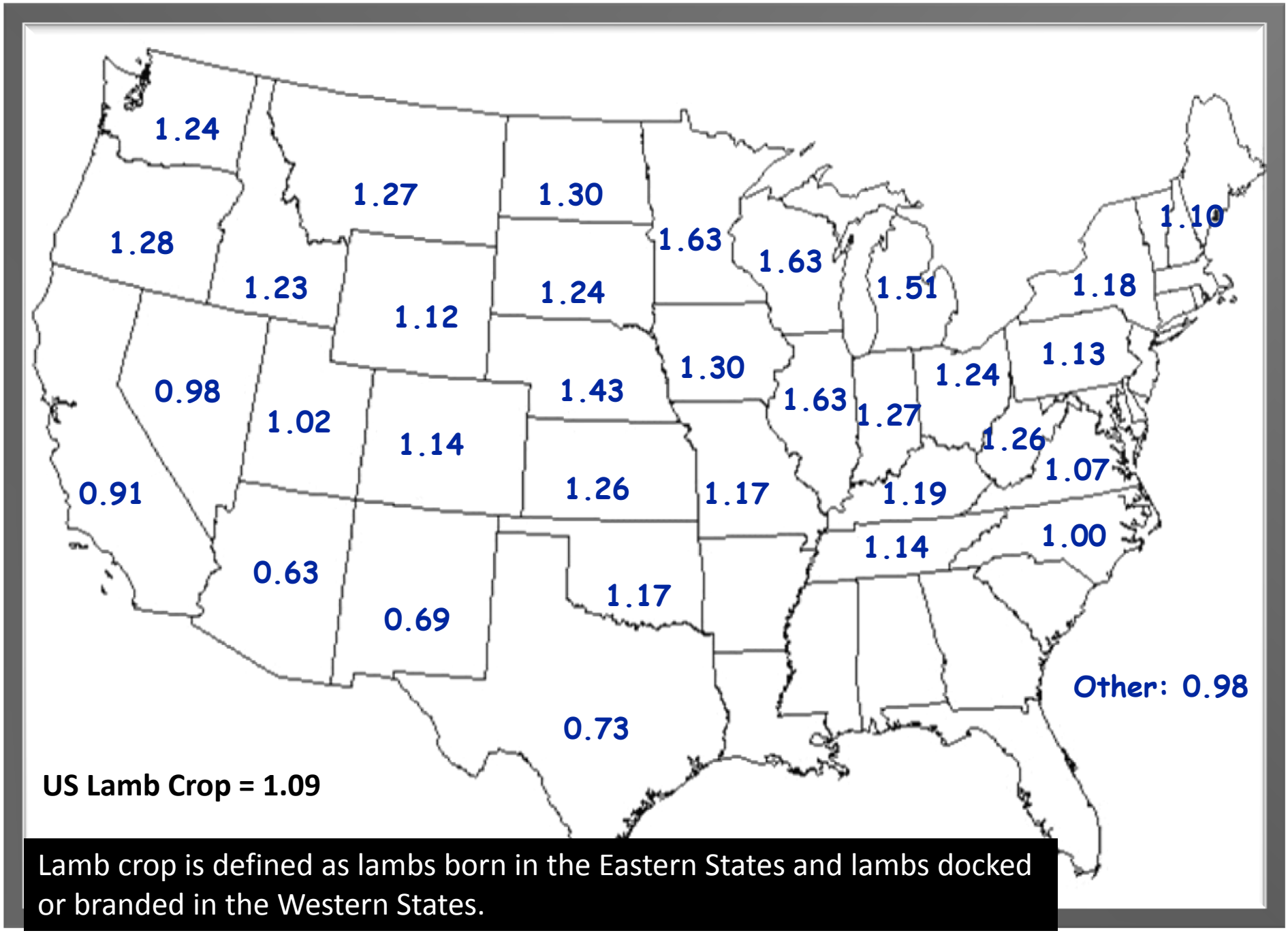


NSIP Success Stories



NSIP Success Stories



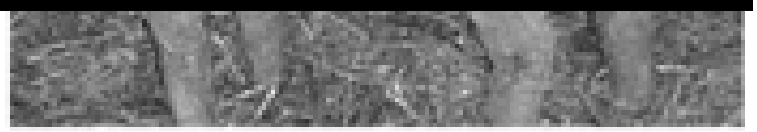


Lamb crop is defined as lambs born in the Eastern States and lambs docked or branded in the Western States.

How EPD's are used?

In the current lamb market, that equates to $10 per lamb. If he sires 50 lambs for 4 years, Ram #2 generate approximately $2,000 more than Ram #1 in his first generation offspring.

than Ram #1



How the Program Works

- Seedstock Breeders Enroll
  - $50 to 350 annual fee based on flock size
    - Waive enrollment fee first year
    - Waive enrollment fee for 3 years for youth (22)
  - Collect data relevant to flock and breed
  - Enter data into software program
  - Submit data to LambPlan (Sheep Genetics)
    - $2.65 per animal (90 days)
  - Produce Estimate Breeding Values
  - Use EBVs for Marketing and Selection

How the Program Works

- Commercial/Seedstock Producers
  - Purchase sheep with EBVs
- Montana Ram Sale
  - Rams with EBV Data - $
  - Rams without EBV Data - $

How the Program Works

- Estimated Breeding Values (EBVs)
  - Growth Traits
    - Birth Weight (kg, 24 hours)
    - Weaning Weight (kg, 45 to 90 days)
    - Maternal Weaning Weight (kg, Milk)
    - Post Weaning Weight (kg, 91 to 305 days)
    - Yearling Weight (kg, 290 to 430 days)

How the Program Works

- Estimated Breeding Values (EBVs)
  - Reproduction Traits
    - Number of Lamb Born (%)
    - Number of Lambs Weaned (%)
  - Carcass Traits
    - Loin-Eye Muscle Depth (mm, PWWT)
    - Fat Depth (mm, PWWT)
  - Parasite Resistance
    - Worm Egg Count (%, WWT or PWWT)

How the Program Works

- Estimated Breeding Values (EBVs)
  - Wool Traits
    - Fleece Weight (%, yearling)
    - Fiber Diameter (um, yearling)
    - Staple Length (mm, yearling)
  - Indexes
    - Carcass Plus (+PWWT, +EMD, -FAT)
    - US Hair (+WWT, +MWWT, +NLW, -NLB)
    - US Maternal (+WWT, +MWWT, +NLW, -NLB)
    - US Range (+PWWT, + MWWT, - YWT, +FW, -FD, +NLB)

How the Program Works

- Lamb Weaning Weight
  - Adjustments
    - Age/BW
    - Birth/Rearing Type
    - Age of Dam
    - Sex
  - Difference from Mean
    - Farm
    - Lambing Season (35 d)
    - Report all data

How the Program Works

- Progeny Testing
  - Animal is the average of Sire and Dam
  - Sire and Dam EBVs are adjusted based on lamb performance compared to other sires and dams in the contemporary group

How the Program Works

SHEEPGENETICS

Analysis : **USA TERMINAL** , 1 August 2013

Sires

Animal ID	Inbreeding	Prog:Flks	Bwt kg	Wwt kg	Pwwt kg	Pfat mm	Pemd mm	NLB %	NLW %	Psc cm	Mwwt kg	Lamb2020	Carcase+	Sire / Dam
693011-2011-111029		26:1	-0.40	-0.9	-0.1	-0.1	0.8					101.1	107.2	693011-2008-SC1036
NORTH DAKOTA SU		Acc.:										54	76	693011-2006-066542
693011-2011-111081		25:1	0.09	2.9	7.0	-2.3	0.3					106.1	144.7	693011-2008-SC1036
NORTH DAKOTA SU		Acc.:										51	73	693011-2006-066699
693011-2011-SP1121		34:1	0.21	-0.4	-2.3	0.9	-0.6					97.3	80.0	*
NORTH DAKOTA SU		Acc.:										49	69	*

How the Program Works

Sire Report - Hampshire - Proven Sires **NSIP**

Carcass+ **July 2013**

ID Flock	Prg:Flks	BWt kg	WWt kg	MWWt kg	PWWt kg	PFat mm	PEMD mm	NLB %	NLW %	PSC cm	Lamb 2020	Carc.+	Sire Dam
693003-2012-012013 *University Wisconsin*	10 : 1	0.54 *77.0%*	2.67 *76.0%*	-0.27 *35.0%*	3.48 *79.0%*	-3.14 *0.0%*	1.39 *82.0%*	-5.40 *28.0%*	-5.3 *24.0%*	-0.8 *38.0%*	106.2	147.0	6930032011011031 *6930032009009162*
693011-2011-111081 *NDSU*	25 : 1	0.14 *77.0%*	3.11 *77.0%*	0.27 *25.0%*	7.50 *79.0%*	-1.90 *0.0%*	-0.42 *63.0%*	-0.50 *14.0%*	-1.2 *11.0%*	0.0 *0.0%*	104.9	136.4	6930112008SC1036 *6930112006066699*
693005-2007-BLT777 *IA STATE UNIV.*	66 : 1	0.39 *83.0%*	1.39 *79.0%*	0.26 *16.0%*	2.29 *83.0%*	-2.61 *0.0%*	0.73 *86.0%*	-0.50 *10.0%*	-1.4 *8.0%*	0.0 *0.0%*	104.0	130.2	
693004-2012-1215F2 *Richard and Mark Roembke*	9 : 1	0.14 *59.0%*	1.25 *71.0%*	0.17 *33.0%*	2.11 *74.0%*	-1.76 *0.0%*	1.11 *75.0%*	-1.50 *28.0%*	-4.7 *23.0%*	-0.5 *34.0%*	104.1	130.2	69300420111115M2 *69300420102C1029*
693003-2011-011031 *University Wisconsin*	64 : 1	-0.20 *87.0%*	0.20 *85.0%*	-0.08 *39.0%*	-0.71 *87.0%*	-0.59 *0.0%*	2.42 *87.0%*	-1.70 *32.0%*	-6.5 *26.0%*	-1.3 *68.0%*	103.8	128.0	6930032010010075 *6930032009009145*
693003-2010-010120 *University Wisconsin*	31 : 2	0.71 *78.0%*	1.91 *77.0%*	-0.88 *50.0%*	2.92 *78.0%*	-3.10 *0.0%*	-0.02 *72.0%*	-8.10 *44.0%*	-9.4 *38.0%*	-0.3 *36.0%*	103.5	127.0	6930032005DF1283 *6930032009009120*
693003-2008-008084 *University Wisconsin*	65 : 1	0.15 *88.0%*	0.95 *87.0%*	-0.24 *67.0%*	1.23 *88.0%*	-1.61 *0.0%*	1.10 *79.0%*	-3.80 *55.0%*	-5.9 *46.0%*	-0.3 *52.0%*	103.4	125.6	693003200707109S *6930032005005066*
693011-2008-SC1036 *NDSU*	67 : 1	-0.28 *80.0%*	1.89 *80.0%*	0.06 *41.0%*	6.24 *82.0%*	-0.56 *0.0%*	-0.34 *60.0%*	-0.50 *13.0%*	-0.8 *10.0%*	0.0 *0.0%*	103.4	124.7	
693003-2010-010075 *University Wisconsin*	31 : 1	0.10 *83.0%*	1.37 *82.0%*	-0.34 *53.0%*	1.99 *84.0%*	-0.88 *0.0%*	0.74 *83.0%*	-1.90 *42.0%*	-3.1 *34.0%*	-0.7 *41.0%*	103.0	122.2	6930032009DF1550 *6930032008008056*
693003-2007-07109S *University Wisconsin*	27 : 2	0.42 *82.0%*	0.57 *84.0%*	-0.65 *69.0%*	-0.50 *84.0%*	-2.00 *0.0%*	0.99 *76.0%*	-8.40 *59.0%*	-7.8 *51.0%*	-0.8 *45.0%*	102.5	119.0	6930032005DF1283 *6930032006000300*
693003-2008-08146S *University Wisconsin*	73 : 2	0.56 *80.0%*	2.69 *86.0%*	0.19 *58.0%*	5.05 *87.0%*	-1.86 *0.0%*	-1.10 *82.0%*	5.40 *49.0%*	-4.8 *41.0%*	1.2 *42.0%*	102.5	119.0	6930052007IS7104 *6930032007007113*
693003-2010-010006 *University Wisconsin*	17 : 1	1.03 *76.0%*	4.39 *76.0%*	-0.06 *50.0%*	7.62 *78.0%*	-2.48 *0.0%*	-2.48 *73.0%*	5.80 *35.0%*	2.7 *29.0%*	1.1 *23.0%*	102.3	118.7	6930052007IS7104 *6930032006006034*
693004-2007-Z735TW *Richard and Mark Roembke*	55 : 1	-0.19 *64.0%*	0.52 *81.0%*	-0.09 *43.0%*	1.34 *81.0%*	-0.33 *0.0%*	1.00 *72.0%*	-2.10 *37.0%*	0.4 *30.0%*	-0.4 *35.0%*	102.6	118.6	6930042006000122 *6930042004000064*
693004-2010-2C1019 *Richard and Mark Roembke*	36 : 1	0.08 *70.0%*	1.71 *82.0%*	0.86 *47.0%*	3.34 *84.0%*	-0.65 *0.0%*	0.03 *83.0%*	-1.70 *39.0%*	-4.7 *32.0%*	-0.2 *35.0%*	102.5	118.6	69300420080W839S *6930042008R810TW*
693004-2011-1115M2 *Richard and Mark Roembke*	23 : 1	0.04 *68.0%*	1.05 *80.0%*	0.10 *40.0%*	1.20 *82.0%*	-0.42 *0.0%*	0.78 *82.0%*	-3.50 *34.0%*	-5.0 *28.0%*	-0.9 *66.0%*	102.3	117.3	6930042007Z735TW *69300420080W800S*
693004-2008-0W839S *Richard and Mark Roembke*	43 : 1	0.37 *75.0%*	1.49 *85.0%*	0.57 *61.0%*	0.98 *86.0%*	-1.02 *0.0%*	0.50 *84.0%*	-9.90 *51.0%*	-14.0 *43.0%*	-0.3 *34.0%*	102.2	116.8	693003200707109S *6930042006636PTW*

Conclusion

- It Works! Use it!
- Enrollment forms are available on the website: www.nsip.org

ASI Convention

- Genetic Stakeholders Meeting @ 1 pm (1/23/14)
  - Enhancement of NSIP, Why it is not the 1980's version, Reid Redden
  - Using NSIP in the Industry. Confession of a retired sheep specialist, Rodney Kott
  - How to stretch the impact of your genetics: a Cooperative Breeding Group that actually works, Kreg Leymaster
  - How to breed or select terminal sires to improve your lambs when marketed in a value based system. David Notter
- NSIP Board Meeting @ 3 pm (1/23/14)
  - NSIP Business, Open Meeting
  - Election of Officers/Directors
- Register at www.sheepusa.org

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