

Dairy Sheep Genetics Improvement Project

DSANA Genetics Improvement
Project Workgroup

Report

and

2017 Proposal



Overview

- 2017 ASI grant application successfully funded: for \$10,000
- Goal-Develop a plan of action to improve milk production, lamb production and wool production of the American Dairy Sheep
- Objectives:
 - Develop systematic approach to gathering sheep dairy production data
 - Develop the means for developing estimated breeding values within and across dairy flocks

Workgroup Action Steps to Date

- August 2017 planning retreat:
 - Three-tiered proposal for building sheep dairy genetic data base
 - Continued work on building data flow between producer, milk-testing entities and GenOvis (EBV's)
 - Producer survey: current industry status
- Ongoing challenges
 - Balance of costs, time, and returns to producer and industry
 - Cross-flock viability requires industry-wide participation –data on large numbers of ewes and rams

Dairy Sheep Producer Survey

47 Respondents

- 66% of producers milking 5 years or less
- 2017: 49% milking 50 ewes or less; 24% milking 100 or more; 2018 projections: 30% milking 100 or more
- 93% (43) collecting most of the tier-I data
- 57% (27) currently recording individual ewe milk production
- Other data: Protein(7); BF (6); SSC (10); Milk solids (5)

Tier One: baseline data

- ***Milk measured a minimum of five times per ewe per lactation***
- Lactation number, *age of first lambing, lambing intervals*
- Parentage, date of birth, sex, *litter size, survival*
- Breed type
- Management codes: lamb rearing protocols, ewe flock management protocols*
- The above data will result in EBVs for yield, reproduction (litter size), age at 1st lambing, and parity yield.
- All farms receiving semen through the DSANA Semen Importation Project are expected to participate, at a minimum, in the Tier One record-keeping program.) *Identification of all F1 progeny must be tracked for five (5) years for all offspring from imported semen.*

Return to producer – in-flock estimated breeding values for replacement selection

Tier Two

All of tier one plus the following:

- Milk composition analysis (*Protein, Butterfat, Somatic Cell Count, Lactose, MUN-Protein, BHB-nutrition-ketosis*) through a certified laboratory (i.e. Dairy Herd Improvement)
- *Lamb weights at birth and 30 days, adult weights and condition scoring at breeding*
- Single sire mating and/or DNA blood cards with multiple-sire breeding for lambs and sires.

This tier begins the process of developing a cross-flock database for industry-wide EBV predictions

Tier Three: Comprehensive

Provides possibilities for developing source flocks for dairy sheep breeding stock with production and health records

- DNA blood cards collected on all lambs and sires. Cards will be collected, logged, and stored in a central repository for future genetic analysis.
- Udder morphology and dairy conformation type analysis
- Animal health and disease testing and assurances (Scrapie, OPP, Brucellosis Ovis, etc)

What is an Estimated Breeding Value?

- Measurements calculated to determine the heritability of individual traits or the amount of influence that genetics have on that specific trait.
- Incorporates: Individual traits, contemporary groups in their environment, pedigree, and genetic links
- Used to identify genetically superior animals in the flock in order to pass the best genetics on to future members of the flock
- Allows buyers to know what genetics they are buying and to compare the genetic merit of rams or ewes
- Allows for productivity improvement and increased profitability

Russel Burgett, NSIP, *Estimated Breeding Values: How they are calculated and what it means to producers.*

EBV's – On the Farm

Inputs from producer

- A minimum of five milk measurements/lactation from all lactating ewes
- Lambing data (per tier one)
- Description of management system

Returns to producer

- Numerical ranking of ewes and rams compared to flock average
- Inbreeding coefficient
- 5% improvement each year including both ewes and rams

Reading the Numbers

Rams (highest EBVs)

Animal ID	Sire ID	Dam ID	Birth Date	EBV, g/lactation	Acc
R769	R658	Y3125	20070803	656.07	0.51
SG81F				614.72	0.54
R778	R658	F2029	20070912	599.83	0.51
R509	2S251	32J	20050413	597.68	0.63
R510	2S251	32J	20050413	597.68	0.63
R511	2S251	32J	20050413	597.68	0.63
R659	R4040	Y3209	20060820	592.26	0.51
R777	R658	2S208	20070907	590.43	0.52

Sample of EBV and accuracy for youngest ewes (3,098 total ewes evaluated):

Animal ID	Sire ID	Dam ID	Sex	Birth Date	EBV, g/lactation	Acc
Y7053		Y4003	F	20070223	56.97	0.42
Y7047		2S048	F	20070222	166.9	0.44
Y7032		F2059	F	20070216	132.42	0.43
Y7030		2S057	F	20070213	138.28	0.45
Y7012	R509	Y4224	F	20070130	451.17	0.52
Y7008	R509	Y5192	F	20070129	376.5	0.47
Y7007	R534	F2064	F	20070129	134.23	0.52
F2176	2S251	CXB1040	F	20070129	-23.83	0.63

Doing Some Numbers

Baseline estimation:

- Average 500# milk/ewe/lactation; \$1.00/pound milk; 50 ewes = \$25,000

Year one estimated production improvements with both ram and ewe in-flock EBV's:

- 5% increase in production due to in-flock EBV's
- 525# milk/ewe/lactation average; \$1.00/pound; 50 ewes = \$26,250 in first year

Rams originating from established sire selection systems may well produce greater results.

Estimated Investments

- Milk measuring equipment
- Producer time (testing, record keeping)
- Official/unofficial test (Tier Two)
- Local/regional DHI, Dairy One, etc.
- GenOvis analysis

Making the Case

- Axel Meister: Wooldrift Farm, Ontario
- Mariana Marques de Almeida: MsJ & Company, Wisconsin
- Bee Tolman: Meadowood Farm, NY
- Tom Clark: Old Chatham Shepherding Farm, NY
- Liam Callahan: Bellwether Farm, CA

WE HAVE GREAT OPPORTUNITY...

The producers who have imported semen have the opportunity to move the genetic capacity of the sheep dairy industry forward in a large way:

- Track progeny for five years (USDA Required)
- Become, *at minimum*, Tier One participants, including all milking ewes in the testing regimen.

In 2018, make a commitment to grow our industry and improve your bottom line!

DSANA Genetics Improvements Workgroup Members

- Axel Meister: WoolDrift Farm, Ontario CA, DSANA Board
- Bee Tolman: Meadowood Farm, NY, DSANA Board
- Bill Halligan: Irish Cream Sheep Dairy, NE, DSANA Board
- Dr Ronald Lewis: Professor Animal Genetics and Genomics
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- Dr Flavio Schramm Schenkel: Professor, Director Centre for Genetic
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- Liam Callahan: Bellwether Farms, CA, DSANA Board
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- Tom Clark: Old Chatham Shepherding Farm, NY, DSANA Board
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