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Merino Sheep

Then and

Now

DELORES HAGGE
Merino Sheep Then and Now

In-depth study prepared for Olds College

(As part of the requirements for the Master Spinner Certificate)

Olds, Alberta, Canada

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Summary

The purpose of this project is two fold.

1) To become better acquainted with some of the breeds of Merinos; their weaknesses and their strengths.
2) While Merino fleece is well known for the fine lace weight yarn needed for shawls and other lace items, it can be spun into yarn with a heavier grist. This makes it a good, all around yarn that can be made into more casual clothing.
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Introduction

Merino sheep are an ancient breed whose fleece has been, and still is valued in the fiber industry. Their fleece is very fine, ranging from approximately 80 to 100 microns.

Merino sheep are believed to have been introduced into Spain as late as the 12th century by a tribe of Arabic Moors. Merino sheep in Spain became noted for it's fine wool.

Spain jealously guarded their Merino sheep, and did not allow their export until the 1700's. After that, they gradually became known throughout the world, and now a high percentage of sheep carry Merino blood.

There are several species of Merino sheep that have been bred for various traits. Some common types are the Saxon, known for their amazingly fine fiber; the Delaine, a larger sheep than the Saxon; the Booroola, which is raised for it's ability to be prolific. Even though these changes were made, the Merino fleece remains fine.

It is noted that some woolen products in stores today carry a tag stating "this garment contains Merino wool".

The Merino fleece is a challenge to spin, however it is well worth the effort if a soft, delicate finished product is desired.
About Merinos

Merino sheep are an ancient breed that has been introduced to various parts of the world. They are especially prized for their fine wool that can have a micron count as high as 100. Because of the fineness of their wool, the Merinos have been crossed with many other breeds of sheep.

Various kinds of Merino sheep were developed by breeders in order to improve the fleece quality, develop a larger sheep that would produce more meat, or ewes that would give birth to multiple lambs.

Following are some highlights of the three main breeds of the Merino.
Sheep #1 is a picture of a Merino showing the ‘prized’ folds in an original breed.

Sheep #2 shows the Merino as they mostly appear today.
One of the original breeds is the Saxon Merino that originated in Spain. This sheep is small in stature, and has superior fine fleece. Saxon Merinos have natural folds in their skin which hold extra follicles. The (folds) follicles were a desired trait because they produce more fiber. However, in time the folds caused problems such as low grade wool, and extra time required at shearing time. Over time some of the folds were bred out. These Spanish Merinos were jealously guarded, and before the 1700’s the export of Merinos from Spain was punishable by death.

Finally in the 1700’s a major consignment was sent by Ferdinand V1 of Spain to his cousin Prince Xavier the Elevator of Saxony, Germany. That is how the name "Saxon Merino" came about. The Merino breed remains a major breed in Germany, however, there has been three major genetic changes made in this breed. 1. The Merinofleischaf which grows easily and has good meat yield. 2. The Merinolandscha bred to produce a longer wool growth. 3. The Merinolangwollschaf produces a long staple wool that is very white and tighter in character. At present, the Merinolandschaf makes up approximately 40% of Germany's sheep.
The name "Delaine" is derived from two French words. De, meaning 'from', and laine meaning 'wool'. In the late 1700's Louis XVI received 366 select ewes from his cousin King Charles III of Spain. He then founded the stud at the Royal Farm at Rambouillet, France. The name "Delaine" originated at the Rambouillet farm. In the 1800's a large flock was exported to the United States. A careful crossing was made using the pure Spanish Merino with the Black Top Merino to develop the breed further.

Mr. Dickinson of Steubenville, Ohio developed a large flock. Among them were some prize winning sheep. Dickinson sold most of his flock in 1830 to a Mr. James McDowell who was a sheep herder for Mr. Dickinson. Mr. McDowell continued to raise his flock of Merinos with utmost purity until he retired. Although Mr. McDowell ranched in Ohio, he sold sheep throughout the United States. Dickinson did keep a few of his flock. Among those kept was a ram named Bolivar; and from his genes the Delaine sheep developed their own characteristics.

There are three distinct types of Delaine Merinos -- A, B and C.

**Type A:** This fleece is often angular and has little carcass value. It is a small sheep, and not practical for commercial breeders. The sheep produces a heavy fleece. Type A sheep have a very heavy, wrinkly hide. Fleeces from rams weigh up to 25 lbs, and fleeces from ewes range from 12 to 20 lbs.

**Type B:** This sheep was developed principally in Ohio. The breeders were selecting sheep for their heavy meat and also good fleece weight. Some of the wrinkling in the hide was bred out, but it still has shoulder, neck and thigh folds. Fleece from a type B Delaine Merino can weigh as much as 25 lbs.

**Type C:** This the most hardy of the Delaine breeds. Type C Merinos are found from coast to coast, but are most prevalent in the South Western and Western United States.

These sheep are a good range sheep. They will thrive in desert land at sea level and in the mountains at an altitude of 10,000 feet. In general, the Delaine Merino is a medium size animal. In general, the Delaine Merino is a medium size animal. Mature ewes with full fleece will range in weight from 125 – 180 lbs. Rams with full fleece will range from 175 – 235 lbs. in weight.
Booroola Merino

The Phoenicians introduced Merino sheep from Asia Minor into Africa. In the late 1790's Captain Waterhouse of England purchased Merino sheep in what is today Cape Town, South Africa. When Waterhouse later sailed to Sydney, Australia he brought with him a flock of Merino sheep. These sheep he sold to a Captain John MacArthur. MacArthur and his wife, Elizabeth went on to expand their newly acquired flock. By 1820 MacArthur had shown and sold a total of 39 rams. These Merino sheep, from the original Waterhouse flock, would become hosts for the study of the Fec B gene; later known as the Booroola Merino.

The trait that sets the Booroola Merino apart from the other Merinos is their high rate of multiple birthing. Scientists have learned that the Booroola sheep carry a gene called the Fec B gene. This gene seems to have originated in India from a small sheep (unrelated to the Merino) known as the "Garo" sheep. In the late 1700's a small flock of Garo sheep was exported to Australia where they were bred to the larger Merino breed. The flock continued to expand, and by 1855 a farmer by the name of Smith owned over 35,000 of these Merino-Garole (Booroola) sheep. In the 1940's, sheep producers were taking special note that the Booroola sheep owned by the Seears brothers of New South Wales, Australia were consistently producing 170 to 180% birthing rates. In other words, ewes were producing 1.7-1.8 lambs per season compared to an average of 1.0 to 1.5 in other flocks. In 1965 the Common Wealth Scientific and Industrial Research Organization (CSIRO), which is based in Perth, Australia, purchased 91 Booroola ewes and began to study their ability to carry and give birth to multiple lambs.

New Zealand received their first Merinos courtesy of Captain Cook in 1773. Several more flocks were imported between 1840 to 1860. New Zealand researchers mapped the Booroola Fec B gene to chromosome 6q2321. It was recognized that this gene could be introduced into other sheep for the purpose of multiple births per ewe.

In the 1800's, a flock of Merino sheep made up largely of descendants of the Spanish Merino was imported into the United States by Richard W. Meade. He settled them near Philadelphia, Pennsylvania. From there the Merinos were purchased by farms in other states. A large flock was
brought to the Tamarach Lamb and Wool farm in Minnesota. Janet McNally from the Tamarach Ranch and Research Center introduced artificial insemination (AI), and followed the results. Her opinion was that the Merino sheep were not the best host for the Fec B gene because they are less capable of supporting multiple fetuses, and are not a good milking breed. Therefore, other breeds such as the Dorset sheep are carrying on the history of the mysterious Fec B gene.

**Conclusion**

The Merino sheep have gone through several breed changes over the years. When the Merino was introduced into different countries around the world, crossbreeding with the local breeds would occur. This was done in an effort to improve the quality of their sheep. Whether it be for improved fleece, mutton or overall heartiness. Fortunately the best quality of the good fleece, which is its fineness, has remained the same. I’m sure there will be other Merino breeds developed over time, but to my knowledge the Booroola is the latest.
How to select a good fleece

When selecting a good fleece, no matter what the its end use, there are certain characteristics, or problems to be aware of.

The staple should be sound (no breakage when tested), and should be an average length for a year's growth. Be on the look-out for an excess of the extremely short fibers called “second cuts”. Second cuts will end up as 'knots or 'neps' in the yarn. Any fleece should be relatively free of foreign matter.

Other characteristics that should be considered are:

**Kemp:** This is stiff, white fiber that will take dye poorly. It is acceptable if a heather yarn is desired.

**Crimp:** This is when a strand of wool fiber does not lay absolutely straight, rather it has kinks in it which is called 'crimp'. The rule of thumb for this is: the more crimps in the strands of wool, the more TPI there should be in the spinning process. Some wool will have very little crimp and will resemble waviness.

Merino fleece is very fine and has a lot of crimp as is the case in most fine fibers. If very little crimp is wanted, watch for a fleece from a breed that has longer wool. The fleece will not have the same feel (handle) as the Merino fleece, but will have a coarser feel and be more suited to items requiring hard use.

**Felting properties:** Merino fleece is known to be good for felting, however dark wool from Merino sheep may not felt as well.
Shearing

Sheep shearing is simply a process where the wool fleece is cut off the sheep. This typically is done once a year usually before spring lambing.

The shearing is usually done in a shearing shed by a person who is called a "shearer". A shearer who can shear 200 or more sheep a day is called a "gun shearer".

The process of shearing has changed somewhat over the years. Up until the 1870's sheep were washed prior to shearing. There were three main reasons for this practice:

1. English manufacturers demanded that fleece be free from vegetable matter, burrs, soil, etc.
2. Dirty fleeces were harder to shear and required the shears to be sharpened more often.
3. Wool was carted by bullock or horse teams. The weight of the unwashed wool made it more difficult to transport.

In the 1890's wool was sold strictly by weight. Producers began to realize that they were losing money by selling the wool after it was washed. Up to 50% of the gross weight consisted of oil, dirt, vegetable matter, and manure, which would be lost in the washing. So, the washing of wool became obsolete.

The earliest shearing was done using a device called blade shears. The shears resembled an over-sized scissor. See item #1 and #2 on page 14. As time went on, shearing became more modernized. By 1915 most large sheep stations had installed machines driven by steam, or later by electricity. These new shears resembled hair clippers, and are the main device used in shearing today. See item #3 on page 14.

After the sheep are shorn, the fleece is thrown on a wool table (see item #4 on page 14) where it is skirted (vegetable matter and manure are removed). From there it is rolled into a bundle and placed in a holding device. Very large sacks made of canvas or woven polyurethane that can hold several hundred pounds are the most common holding devices used.

Shearing is a labor intensive work. People who are professional shearers go on to compete and become well known in the sheep industry.
Pictures of Equipment

**Item # 1**
Blade shears

**Item # 2**
Blade shearing demonstration at the New York Sheep & Wool Fair

**Item # 3**
Machine shearing a Merino, Western Australia. The shearer is using a "sling" for back support.

**Item # 4**
Throwing a fleece onto a wool table.
Fleece Washing

1. Prior to washing, carefully remove as much foreign matter from the locks as possible without disturbing them.

2. Place the locks in a mesh bag.

3. Place the bag in a basin of very hot water. (60C./140F.) Add detergent.
   (I use Dawn liquid dish soap as it is a wonderful 'degreaser'.)*

4. Allow the fleece to stay in the basin until the water cools somewhat.

5. Squeeze the water from the bag, refill the basin and repeat the procedure. (Usually the second soak will remove the soil.)

6. Check the tips; sometimes they need to be rubbed a bit to coax the most stubborn soil out. If the soil won't come out, just trim the ends off.

7. To rinse, leave the locks in the bag. Fill the basin with water, using the same temperature as the wash water. This is to prevent shocking the fiber which may cause felting.

8. Carefully press the bag down in the water a couple of times. Squeeze the water out and repeat the procedure until the water is quite clear.

9. Remove the locks from the bag and lay them out to dry with the tips pointing in the same direction.

*Merino fleece contains a lot of oil. As much as 50% of the fleece weight might be lost with the removal of the oil and foreign matter.
Prior to Spinning

The decision has to be made for how the fleece is to be prepared for spinning.

The choices are:

1. Spin from the lock
2. Card the fleece
3. Comb the fleece

If spinning from the lock, the locks should be opened with a flick carder, or brushed with metal teeth. The locks can be spun from either end, however, it is usually recommended to spin from the tip end.

It is difficult to keep the fine fibers from breaking, so when carding use a fine card cloth to avoid “neps”. These are the broken fibers that roll up and form little knots.

Combing the fleece removes any broken ends, and results in a smooth line of fiber. From there it can be spun worsted.

It is a good idea to have a plan for the finished yarn. Merino has a lot of crimp, this should be considered in the grist* of the yarn. Merino fleece will do the best if it is spun with quite a lot of TPI so it will match the crimp somewhat.** Another factor to consider is the angle of twist as it will affect the luster of the finished product.*** In other words, it is advisable to sample the yarn to see what is preferable.

*Grist is a term used for the thickness of the yarn.

**TPI: twist per inch.

*** The angle of twist is seen by the slant of the fibers in the finished yarn. The angle will affect the luster, as light reflects differently off the fibers at different angles. I recommend that you read Mabel Ross’ book The Essentials Of Yarn Design For Handspinners for more detail.
Spinning

At this point the fiber has been washed, dried, and either flick carded, combed, or carded. Now the choice has to be made as to what method of spinning you want to use.

Your choices are to use either a drop, or support spindle, or else to use a spinning wheel.

Assuming you have decided to spin on your spinning wheel, here are some suggestions to make the spinning go more smoothly.

1. Choose the smallest whorl on your wheel.

2. Adjust to a very light tension.

3. Try using a natural material for the drive band.

4. Start with a partially filled bobbin. This allows you to have less tension on the brake band making it easier to spin a fine fiber.

5. Spin to straighten but not stretch the crimp.

6. Leave the singles on the bobbin overnight to set.

7. To ply, have the lazykate at a height where the singles run close to a straight line to the orifice.

8. Use an even, rhythmical movement.

9. Check the yarn from time to time for a satisfactory amount of twist.

10. When ready to wind off, wind the yarn on only 1/2 of the niddy noddy then there will be less stretch occurring.

11. Tie the skein loosely being careful to leave enough room for the yarn to swell when it gets wet.

12. Wash the skeins carefully in warm to hot soapy water.

13. Rinse and stretch the skeins lightly by hanging the skein over a dowel or doorknob. A light weight such as a can of soup may be added to the loop of the skein.

Finally, I would like to recommend to you Margaret Stowe’s book, “Spinning Merino”.

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About the Author

Our family is from the rural parts of northwest North Dakota.

I consider myself fortunate to have grown up on a farm. I had some of the responsibility for the care of our farm animals, which I enjoyed very much. However, I didn’t work with sheep until much later in my life. In fact, when I was married...some 60 years ago..., I moved to ‘the city’, and lost touch with animals except, of course, for a variety of house pets.

When my parents retired from farming, my husband and I took over the operation. Eventually the family farm became our permanent home.

Now that we were on the farm, I felt a strong desire to have some animals around. My original thinking was of just having some pets around the farmstead. But then my daughter and I decided to go into some sort of business involving animals and the idea of having just pets was dropped. We wanted an animal that we could handle ourselves, so sheep came to mind. As it happened, there was a nice flock of Booroola Merinos available for sale at a nearby farm. After quite a lot of deliberation, we purchased a small flock. This was followed by the addition of five goats and one donkey!

Up until this time I had been a serious knitter, and when in a store, the wool yarn always seemed to ‘call to me’. However, when I mentioned this to people, I would often get the response, “oh, I can’t wear wool!” So, I was discouraged to knit with wool. At this time I knew very little about wool fiber, most certainly not that there were different grades available. So, after our first shearing of our Merino sheep, I was amazed at the softness of the fiber, and was determined to learn to spin so I could prove that wool is wearable.

After much trial and error, I did learn to spin first on a drop spindle, then on an Ashford wheel. But, my yarn all seemed to look the same, and I realized that if I was to spin my beloved Merino fleece properly, I would need help. I asked around if anyone knew of a school that taught spinning, and was referred to Olds, Alberta, Canada. I enrolled that same year and worked my way through the required levels to complete the course.
Purple Fleece Sample

I found the Merino lambs wool,

took the dye without any extra

preparation such as pre-mordanting

as is necessary on some wools.

It did not take any additional processing time.

I chose the simple patterning for ease

of knitting. The seed stitch was added
to give the piece more body.
Project Notes (purple sample)

Fiber: Merino lambs wool (combed top)

Dyed with Gaywool dye
according to directions
on the bottle(color: purple)

Wheel: Ashford Joy. Ratio 14:1

Method: semiworsted two ply

Spin direction: ZZS

TPI: 6 Plied wraps per inch: 20

Angle: 42

Count: 18.16 yardage: 2724 yds /lb

Needle size: 2 US (2.75 metric)
**Fleece for Tweed Sample**

Merino is not a hard wearing fiber, however, I feel that by plying it into a cabled yarn it should wear relatively well. I casually blended in a darker fiber, (I used a soft bison fiber) to give the yarn a “sporty” look, and disguise some soil!

To make a four strand cable cord, spin four medium twist singles in Z twist. Make two 2 ply yarns plying in the S direction. Add more twist than is necessary producing an unbalanced yarn. Then ply the two 2-ply yarns together in the Z direction with medium twist to balance.
Project notes (Knit Tweed Sample)

Fiber: Merino 75%, Buffalo undercoat 25%

Wheel: Ashford Joy, Ratio: 14:1

Method: woolen, two-ply

Spin direction: (singles spun z; plied s; cabled z)

TPI: 13

Plied wraps per inch: 12

Angle: 14

Count: 9.8

Yardage: 1362 yards per pound

Needle size: 4 US, (4.50 metric)

Gauge: 5 stitches per inch

9 rows per inch
Lambs Wool Sample
The lambs wool has quite a short staple which makes it hard to work with.
It would be advantageous to blend a longer staple fiber with it. Silk would be nice.
Project notes (white lambs wool)

Fiber: Merino lambs wool (combed top)

Wheel: Ashford Joy, ratio: 14:1

Method: Semi worsted, 2 ply

Spin direction: zzs

Plied wraps per inch: 19

TPI: 5-6 ½
Fleece for White Blend

I blended the fibers on 2 pitch combs.

I used size 4 US., (4.50 metric) needles

which gives some space for the angora to

“blossom”.

It was a joy to spin and knit!

I did not use any particular pattern,

but invented as I went along. I encourage

others to not be tied to a pattern, but use their

imagination.
Project Notes for Wool, Silk, and Angora Blend.

**Fiber:** 50% merino, 30% silk, 20% angora (combed top)

**Wheel:** Ashford Joy, Ratio: 14:1

**Method:** semi worsted, two ply

**Spin direction:** zzs

**TPI:** 5-5 ½

**Plied wraps per inch:** 20

**Angle:** 28

**Count:** 36

**Yardage:** 5448 yards per pound

**Gauge:** 6 stitches per inch

8 rows per inch
APPENDIX

Procedure For Dyeing

Steps to prepare a 1% dye solution:

1. Measure out 100 ml of boiling water.

2. Add 1 gram of dye powder (or amount suggested on dye bottle).

3. Make a paste (mix well).

4. Add 900 ml of warm water, stir and set aside.

5. Weigh dry fiber.

6. Thoroughly soak fiber in warm water.

7. Prepare dye bath using this formula:
   a) Liquid: 40 parts water to 1 part fiber.
   b) Salt: 15% x weight of fiber = grams of salt.
   c) Vinegar: 8% x weight of fiber divided by 5 (if vinegar is 5% acidic acid) = ml of vinegar (add ½ of vinegar at the beginning and ½ after the dye bath reaches 85 degrees).

8. From total liquid arrived at in (a), subtract the amount of dye solution and vinegar needed. This remaining amount will be the amount of water to be used for simmering.

9. Add fiber that has been thoroughly soaked in warm water to the dye solution. Bring dye bath to a simmer and hold for 30 minutes or until the desired shade of color is reached.

10. Lift skeins from the dye and rinse in hot water until water runs clear.

11. Dry flat or weighted, if desired. In general, the larger the skein – the heavier the weight that will be needed. For example, I will use a can of soup for a skein of roughly 20 yards.

   (A note of caution here: since most dye powders are toxic, be sure to wear a mask that will not allow fumes to be inhaled. Do not use the dye utensils for anything other than dyeing)
Pattern for Purple Sample #1

Cast on as many stitches as needed for your project. Keep in mind that the pattern is worked over 5 stitches.

Worked on size 2 US, (2.75 metric)

R1 Purl
R2 Knit
R3 Purl
R4 XX (x) keeping the first and last 3 stitches in garter st.
(x)knit 3 sts, knit the next 2 sts together, yo (x) repeat from x to last 5 sts, knit to end..
R5 Knit 3 sts, purl to last 3 sts, knit
R6 Knit all sts.
R7 Repeat R 5
R8 Repeat R6
R9,10,11 Knit in garter st. XX
R12 Repeat from XX to XX for as many rows as needed

Explanation of abbreviations used in knit patterns:
K..........................knit
K2 tog.............................knit 2 stitches together
R...............................row
St..............................stitch
S1,K1, Passover............. slip one stitch to right needle, knit the next stitch, pass the slipped stitch over the knit stitch
V........................................... design of openwork

XX...................................... beginning and end of a certain section

YO....................................... bring the knitting yarn over the right and continue working.

This will leave a hole if dropped on the next round, or if knit, will make another stitch.
Pattern for sample with open work “V”

To work the “V” pattern I have 17 sts between yo’s at the widest part.

Knit to where the “V” should begin.

Sample worked on size 2 US, (2.75 metric).

R 1. K 2 tog, yo, sl 1, k 1, passover, knit to end of row.

R 2 and all even rows, purl.

R 3 K to 1” before last K2tog, K2tog, yo, sl 1, k 1. Passover, knit to end of row.

R 5. Repeat R3, keeping one additional st between yo’s in all subsequent uneven rows until desired size of “V” us reached.

Explanation of abbreviations used in knitting patterns:

K.........................knit

K 2 tog..........................knit 2 stitches together

R.........................row

St................................stitch

S1,k1,Passover................slip one stitch to right needle, knit the next stitch, pass the slipped stitch over the knit stitch, and drop the knit stitch off the needle.

V.........................design of open work

XX..............................beginning and end of a certain section

YO........................ Bring the knitting yarn over the right needle and continue working.

This will leave a hole if dropped on the next round, or if knit, will make another stitch.
Works Cited


    Spinningdale, Crook of Devon, Kinross, KY13 Scotland, 1983.


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