



JACOB SHEEP BREEDERS ASSOCIATION INSPECTION COMMITTEE FACT SHEET

EXCESSIVE FRECKLING

February 2020

LANGUAGE FROM THE JSBA BREED STANDARD:

- Acceptable but less desirable traits: Patches of color with some bleeding, mottling, or freckling.
- Unacceptable/Disqualifying traits: Excessive freckling in the white wool of young animals.

DEFINITION OF FRECKLING FROM JSBA GUIDEBOOK GLOSSARY:

Freckles (fleece and skin): Three types of freckling can occur.

- A. Small groups of dark spots in the white area of the skin which will produce dark fibers. This may appear at birth or not until one year of age. This is a heritable characteristic.
 - B. **Age spots** appear as small, dark spots (usually a shadow-like gray) on the pink skin as the animal gets older. The fibers growing from this area are rarely affected, as the pigment change only affects the skin. This is a heritable characteristic.
 - C. **Sunburn spots** appear from exposure to strong sunlight. These spots are usually much darker than age spots. They are also very small and may or may not have pigment changes involving fiber. This is an environmental effect.
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DISCUSSION AND PHOTO ILLUSTRATIONS

The term “freckling” is used to describe any small spots of black (or lilac) in white areas of the fleece or skin. However, the type of freckling referred to in the standard as “excessive freckling” refers only to small spots of color in white areas *of the fleece*. Thus, age spots or sunburn spots are not considered a fault. Likewise, freckling found in the hair on the face, ears,

or legs is not considered a fault. Note that freckling does not show up in black areas of fleece.

Freckling that appears in the fleece may also be called “ticking.” Ticking is usually described as progressive, increasing with age. As described by Ingrid Painter in *Jacob Sheep in America*,

“Small freckled areas are often seen in the white area of the patches. The freckling generally increases with age and is not considered a fault in an older sheep. Some lambs are born with this freckling and some to such a degree that the wool is no longer white but a definite grey. This is considered a fault and is highly heritable.”

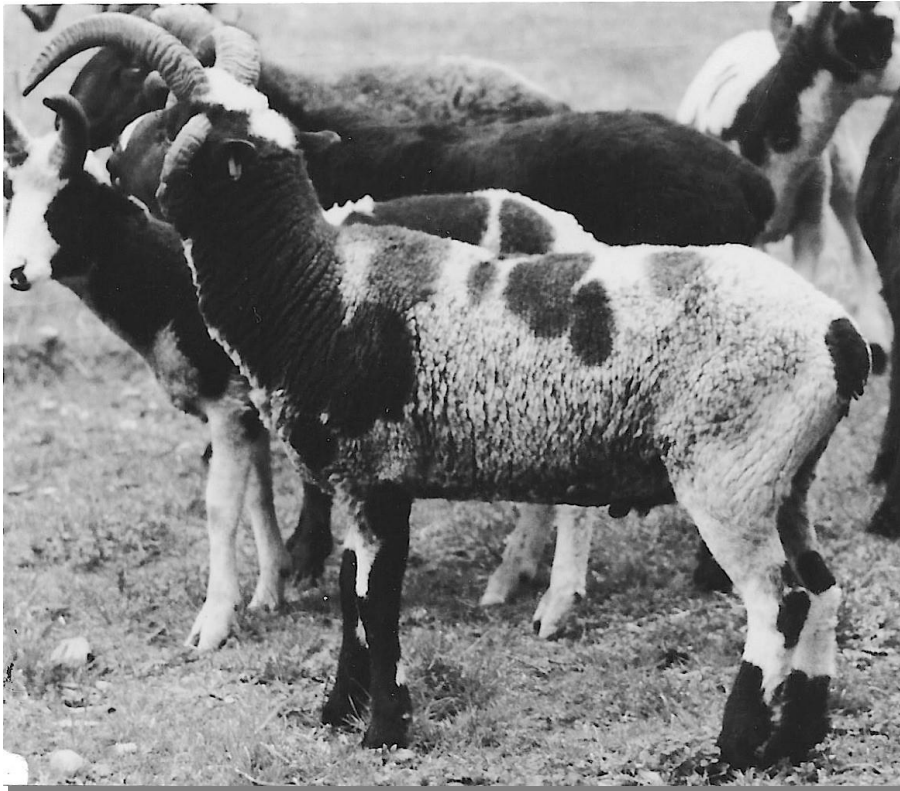


Photo 1: “Excessive freckling of this ram in the white area on this ram give the white wool a gray appearance.”

From *Jacob Sheep in America*, 1997

However, freckling may also appear in young lambs, and remain more or less constant, not increasing with age. There has been some suggestion these two types of freckling are genetically different (see Ingrid Painter in *Jacob Sheep in America*), but this has not been confirmed. In terms of the breed standard, an excessive amount of either type of freckling of the fleece that appears in a young animal is unacceptable. A ewe that is determined to have excessive freckling may be placed in the Appendix Certified (AC) category by the inspection committee.



Photo 2a. Ewe lamb with no visible freckling.



Photo 2b. The same animal as an adult (rear) at age 3.



Photos 3a and 3b: The same ewe as a shorn five-year old (left) and in full fleece as a three-year old, showing the "gray" appearance of a heavily freckled fleece.

Why is freckling important?

Freckling (that is, in the fleece) is considered in the breed standard, and excessive freckling is considered unacceptable, for at least a couple of reasons:

1. **To maintain the Jacob breed's appearance as white sheep with black (or lilac) spots.**
Heavy freckling in a lamb will result in a fleece that looks muddy or even gray in the "white" areas. This is not consistent with the basic description of the Jacob breed. Heavy freckling that alters the basic appearance of a Jacob is the primary reason to disqualify an animal when considering this trait during the JSBA registration process.

2. **Heavy freckling may interfere with some uses of wool.** Essentially, it is impossible to separate a heavily freckled fleece into colored and white wool. Freckled areas will essentially produce a gray wool when processed.

It is true that some handspinners desire freckled fleeces to produce a “tweedy” yarn. This factor will influence a breeder’s opinion of limited freckling, and their decisions regarding freckled adults, as discussed below. However, breeders should be aware that freckling or ticking appears to be highly heritable and can influence the overall appearance of a flock. Thus, a breeder who does not object to freckling should still be aware that some freckling can readily produce *more* freckling. Those breeders who prefer a lack of freckling can select away from this trait but attempting to eliminate freckling is not advised for reasons discussed below.



Photos 4a and 4b. Two photos of the same fleece taken while skirting. Freckling appeared in this ewe by the time she was a yearling. Her fleece is predominantly “white” but is excessively freckled. The “gray” patches are found in the “white” areas of the fleece. This ewe was registered as a lamb when she did not show any freckles. Her fleece may be desirable to some spinners, but should she be retained as a breeding ewe? Different breeders may have different answers to this question.

What causes freckling?

The numerous color patterns observed in many different breeds of sheep are all controlled by several different genes, acting in combination. One important gene in Jacobs is the **spotting** gene or locus. The spotting gene blocks production of the basic black or brown pigment in the white areas of the sheep. Thus *genetically*, the Jacob is a black or brown sheep with white spots.

Ticking (or freckling) is a genetic pattern that produces small black spots or freckles within the white areas produced by the spotting gene. Recent references indicate that the allele (that is, the genetic option) for “ticking” is dominant to the one that retains clear white areas in spotted sheep. (see Bohme, Sponenberg in references). Ticking is not visible within the pigmented parts of the fleece. Because freckling is so closely tied to spotting in Jacobs, it would not be

advisable to try to eliminate freckling, as this would not only be difficult, but could greatly reduce genetic diversity overall.

It is less clear what controls the extent or intensity of freckling, the age that freckles appear, and whether they change with age. It is known that a number of other genes control the production of enzymes and other factors that in turn control the *expression* of freckling – its intensity and changes over time. The Inspection Committee is continuing to gather current scientific information on color genetics. Based on breeder observations, it does appear that the extent of freckling in a sire and dam strongly influence the extent of freckling in their offspring, although as far as we know, the mechanism for inheritance has not been fully defined.

What is “excessive freckling”?

As discussed above, freckling is generally considered to be excessive when it results in a “muddy”, gray, or heavily mottled appearance in the place of clear white spotting. Because heavy freckling tends to increase with age, any reasonably heavy freckling in a young lamb may be considered excessive. Registration may be delayed if desired to determine whether the freckling does increase as expected.



Photos 5a, b, and c. These three photos are of the same ewe and her fleece. The first is taken at the age of about one month; at this point she had some limited freckling visible low on her side. The extent of freckling increased rapidly as she grew. The second photo is taken of her shortly after being shorn at about 11 months of age. The third is of her lamb fleece. She would be considered excessively freckled as a lamb, and her freckling would be expected to increase with age. She was not submitted for registration.

Like some other traits that can cause a Jacob Sheep to fail inspection or place an animal in the AC category, “excessive freckling” is admittedly subjective. To an extent, “excessive” is in the eye of the beholder. However, when the normally white areas of the fleece of a young Jacob sheep submitted for inspection appear heavily mottled or gray, the freckling is clearly “excessive.” Still, determining excessive freckling when a sheep looks gray is the easy part. The challenge is where to draw the line between “some” freckling and excessive freckling where the freckling shows only when an animal is shorn or when the fleece is parted.

One of the considerations is the age of the animal. The standard refers to freckling ***in a young animal***. That is, if freckling becomes excessive and gray looking only in an older sheep, it does not violate the standard, even if it is not ideal for the breeder given the heritable nature of the trait. However, if a lamb or yearling shows an excessive amount of freckling in the fleece, it is unacceptable.



Photo 6: Excessive freckling in a young lamb

Freckles are typically not apparent in a young animal unless the fleece is parted, and if you have to hunt to find them, or can readily count them, they are not excessive. In other words, a wide scattering of freckles within the white fleece – where they don’t greatly influence the color or overall appearance of the fleece – is not considered “excessive freckling” as defined by the breed standard. Likewise, colored spots on the skin that do not extend into the wool are acceptable.



Photo 7: A somewhat freckled mature ewe. This extent of freckling is acceptable.

On the other hand, inspectors may recommend failure/placement in the AC category if:

- much of the white area of a lamb or yearling fleece is heavily infused with freckles that clearly alter its appearance;
- white areas of the fleece appear similar to the characteristic “ticking” in some breeds of dogs (e.g. this Blue Tick Hound);
- or, if the freckling/gray appearance is visible without parting the fleece.



The gender of a Jacob should also be taken into consideration when inspecting a sheep. A ram with freckling may fail where a ewe with the same amount of freckling may pass or be placed in the AC category. Freckling is a heritable trait. A ram may represent 50% of a flock. This has a significant impact on a flock.



Photos 8a and 8b: A wether at 5 months on left, and the same animal at 2 years after shearing on right.

Consideration of freckling during inspections

Practically speaking, it is very difficult to evaluate freckling based on inspection photographs. When freckling is clearly visible in photos of a young animal, it is likely “excessive.” Otherwise, this is a trait that should be carefully considered by the breeder, as the inspector may not be able to observe failure to meet the standard for this trait during a typical inspection. If the breeder seeks an opinion on the extent of freckling from the inspectors, s/he should submit a photo showing the freckling in a parted fleece, or after shearing.

As noted above, freckling may increase in older animals. When an aged animal is submitted for registration and freckling is apparent, photos of the sheep as a lamb or yearling may be considered in determining compliance with the standard.

Where an animal submitted for registration shows significant freckling in the form of sunburn spots, the breeder can assist the inspectors by pointing out whether the pattern of this freckling – e.g. along the topline – is consistent with sunburn. The age of such an animal is also taken into consideration.

The role of the breeder

The inspection committee may fail or recommend the AC category for young Jacobs that are obviously excessively freckled in photographs submitted for registration. However, given that freckling may not be visible in photos taken of lambs unless the wool is parted, the breeder also clearly plays a significant role in making decisions regarding heavily freckled animals. The breeder might, for example, decide to cull excessively freckled lambs rather than submitting them for registration. Jacob breeders will also want to consider whether to keep older breeding animals with extensive freckling that does not appear until they are mature - in particular, rams that pass this pattern on to their lambs.

Breeders having a market for “tweedy” fleeces may want to retain animals with more than average ticking or freckling. The knowledge that freckling is highly heritable should influence the breeder’s decision, as should the amount of freckling already present in the flock and uses made of the wool. Given that freckled wool is not desired by some Jacob owners, the breeder should advise potential sheep buyers of the extent of freckling in a given animal (or for a lamb, its sire and dam), or freckling that is expected to increase as it ages.

If you see unwanted freckling in your flock, choosing freckle-free breeding stock is the best way to address the issue. Elimination of freckling from the breed is neither realistic nor desirable because this dominant trait is very common, and at many levels of intensity is actually desirable to many breeders. However, choice of breeding stock can alter the amount of freckling in an individual flock to meet the goals of the breeder.

Over the years there have been various discussions regarding whether Jacobs with black legs and or feet tend to have more freckling. At present we are not aware of any scientific proof that this is true. However, there does appear to be some thought among some Jacob breeders that one way to breed freckling out of one’s flock is to use a ram with white legs and feet. It should be noted that not all breeders agree with this theory, and there is as yet no genetic information supporting it. Our recommendation for reducing freckling in a flock is to use breeding stock that does not have freckling.

Future Considerations

During preparation of this fact sheet, it has become apparent to the members of the Inspection Committee that there is a vast body of technical information available regarding sheep color genetics, and that our understanding of the genetic factors is expanding rapidly. While not involved with the health of the sheep, color patterns are fascinating and of serious interest to members. Some of us will continue to follow these developments, and we also welcome input from other members. Those who would like to learn more about this topic may wish to obtain the reasonably new (and reasonably priced) book by Irina Boehm listed in the references. It is written for beginners (or those who need a refresher in basic genetic concepts) and is relatively easy to read.

It has also been suggested to us by Maggie Howard (see references) that we develop a basic genetic primer on Jacob sheep for our members, similar to that done by the International Finnsheep Registry (see references). Please let the Board or the Inspection Committee know if you are interested in such a project.

References

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©2019, Irina Böhme, Saskia Dittgen *Available through Amazon and other book dealers.*

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©2012 by Margaret Howard. *Available from the author.*

Howard, Margaret. Personal communication with Peg Bostwick and Linda Bjarkman. Maggie Howard was kind enough to answer many of our questions regarding color genetics via e-mail over a period of a few weeks in 2020.

Horak, Fred. Personal communication with Royal Unzicker.

International Finnsheep Registry. **Finnsheep Color, Pattern, and Marking Guide**. 2013. Available to members of the Finnsheep Registry, and also on line here: <http://www.internationalfinnsheepregistry.org/finn-wool.html>

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South Australian Coloured Sheep Owners Society, 1979. **Breeding Coloured Sheep and Using Colored Wool**. 1979. Peacock Publications, South Australia. *Note: this publication was prepared for the National Congress on Breeding Coloured Sheep, held in Adelaide, South Australia from January 30 – February 3, 1979. It is out of print, but used copies may be found on Amazon and other book dealers.*

Phillip Sponenberg. “Hair Sheep are Not Wool Sheep!” in **Timeless Coloured Sheep**, Edited by Dawie du Toit. 2014. Michael Imhof Verlag GmbH & Co. *Note: this publication was published at the time of the 8th World Congress on Coloured Sheep, held in Paris France. It includes a number of useful articles, as well as numerous photos of various breeds. Out of print, but used copies are available on Amazon and other book dealers.*