

A Basic Guide To Preserving The Colour Patterns Associated With The British Primitive Goat

Raymond Werner, March 2009

Introduction

Improved dairy goat breeds in the British Isles, such as the British Toggenburg, British Saanen, British Alpine and the Golden Guernsey, have a distinctive combination of colour and patterning that we have got very used to. So much so, in fact, that we tend to think of the dairy goat breeds of the British Isles in general as being recognizably mono-coloured. The Anglo-Nubian, of course, is characterized by being multi-coloured as well as having distinctive ears and conformation; and likewise the British Primitive goat is characteristically multi-coloured as a distinguishing feature. It is imperative, therefore, that any attempt to preserve this breed actively seeks to retain all the colour patterns associated with it, and as far as is possible to retain groups of variable colour patterning as this is a powerful visual image associated with the breed. Also, it is one of the tools available to ensure maximum genetic variability in relation to dwindling numbers within the breed.

To date, around 27 colour patterns have been identified in goats and 13 of these have been positively identified with the British Primitive breed, past and present. The aim of this study, therefore, is to offer a guide to distinguishing these colour patterns- particularly in the field- as a first step to working on a plan to preserve each one within the breed.

Glossary

Brisket	<i>The breast.</i>
Co-dominant	<i>When both patterns show in the phenotype, often making a separate pattern.</i>
Genotype	<i>The genetic constitution, in this case the inheritable colour pattern.</i>
Homozygous	<i>Having 2 identical alleles, thus breeding true. E.g. Lightbelly X Lightbelly.</i>
Heterozygous	<i>Having 2 different alleles for a particular gene. E.g. Lightbelly X Bezoar.</i>
Perineum	<i>The rump area.</i>
Phenotype	<i>Observable characteristics, in this case being a genotypic pattern or a co-dominant pattern made up of 2 patterns.</i>

Colour patterns in goats

Basically, all goats are black. Superimposed on this, however, are a number of tan patterns. The tan is variable, ranging from a deep mahogany, through all the shades of red and into sandy, and on into cream and white, the latter merely being a dilute of tan. A goat without patterning is all black and hence called 'no pattern'. Extreme patterning, in which the whole goat is tan, is generally known as 'white', as in the Saanen breed. When the tan has not diluted to white, the goat may be any shade of tan, as in the Golden Guernsey breed.

Importantly, the 27 colour patterns already mentioned do not operate as dominants and recessives, but are co-dominant. This means that both patterns of the two genotypes appear on the goat in the phenotype. However, white will overlay tan generally, and tan will overlay black. Thus, black will only appear in a phenotype on that part of the body that is black in both genotypes. What is important in respect of this is that there may be 27 genotypic colour patterns, but there will also be innumerable phenotypic ones. As some colour patterns only appear as a combination, the loss of one genotypic colour pattern may inevitably lead to the loss of a phenotypic one also.

One complication is that there is an allele on the brown locus that will turn anything black on a goat to brown. This simply means that any goat described as black with a certain patterning may also be brown with the same patterning. Hence, 'Swiss patterning' is basically black, as in the British Alpine, although the Swiss patterned Toggenburg is brown because it has the brown allele.

A system for classifying colour patterns

It would be helpful if the colour patterns could be classified in such a way that quick identification is assisted in the field.

Before describing this system, the following definitions may prove helpful:

Body colour: the colour of the neck and body

Trim: Generally the colour or markings of the distal parts, as on the head, legs, belly, rump and tail. This includes a back stripe, shoulder stripe and chest stripe in some colour patterns.

Colour pattern: A distinct and easily recognizable tan pattern on a black background, as in white face stripes, a white belly or striped legs. Each pattern is made up of a number of markings in combination that never varies, hence the 'Swiss patterning' is made up of white ears, face stripe, muzzle, legs and rump.

The system chosen is to concentrate firstly on the body colour. This may be black, a shade of tan, brown or white.

Secondly, the colour of the trim is described: white, tan or black.

Thirdly, the colour of the legs is described, as in striped, black or white.

Fourthly, the colours of the individual colour patterns are collectively named.

Fifthly, the key identifying features within these sub-categories are described.

Hence, a black goat with white trim, striped legs and face stripes will quickly be identified as the colour pattern Face Stripes, as opposed to a black goat with white trim, striped legs and eye diamonds being a Lightbelly.

An easy recognition chart is included at the end of the study.

Other factors involved in the colour and patterning of goats

Additional to colour patterns, there is the interplay between these and the following:

White patching and roaning

Flecking

Markings confined to small areas of the body

All three will make a goat look radically different, although in most cases the colour pattern will still be discernible.

White patching and roaning.

Random white patching may affect any part of the body and varies in intensity, so that a piebald or randomly spotted goat may be nearly all black, brown or tan or nearly all white. It is a recessive.

Belted affects the mid-body, rather like the patterning of the belted Galloway. It is variable however, and may be reduced in size. Typically, it may appear as a side panel. It is dominant.

Cou Noir is the colour combination of black forequarters and white hindquarters and legs. It is dominant.

Moon spots is like piebald in some ways, but the white patching is oddly spherical or round, often a peculiar shade of tan, and may appear anywhere on the body.

Roan is an even combination of white and coloured hairs throughout the coat that will lighten the basic colour to variable shades.

Some possible confusions and the need for further study

Colour patterns and other characteristics relating to the British Primitive goat have been gleaned from old descriptions, pictures, photographs and a comparison with contemporary stock. There remain some misconceptions as well as holes in our knowledge, however, and these will be alluded to here. This may be as good a time as any to discuss other characteristics and queries as well.

Light brown. Uniformly light brown feral goats have been seen, for example, on the Burren. These may have originated from the British Toggenburg, the Swiss markings having separated from the light brown allele at the Brown locus. It is also possible that brown is found in the British Primitive goat, and this requires further investigation.

White. We know that the British Primitive goat could be white. We should look for British Primitive goats with this colour, therefore, and not assume that all white feral goats owe this colour pattern to admixture with the British Saanen.

Tan and brown. Tan and brown are often difficult to distinguish, but one principle holds true, this being that if a goat has black anywhere on it, what may be either tan or brown will always be tan. This is because brown on a goat has always replaced black. There are three kinds of brown: dark (chocolate), mid- and light brown. Tan is usually brighter than brown, although the kind of tan called fawn is often quite dull.

Hornlessness. The British Toggenburg, British Alpine and British Saanen are typically polled, and it is all too easy to lay the blame on a rise in polled goats in our feral herds at the door of these breeds. The British Primitive goat was polled as well as horned, so any attempt to preserve the old breed should take note of this.

Coat. A long coat is typical of the British Primitive breed, although the major differences between its coat and those of the modern, Swiss-based breeds centre upon its texture- rough, dense, thick, oily, harsh- it being likened to that of the bearded collie. There is also a thick undercoat of cashmere. A major characteristic is the fact that British Primitive males never have a short coat.

Horns. Horn type is variable, ranging from a scimitar to a strong twist (dorcass), with a range of intermediate shapes. The angle of emergence is always high.

Spots, patches, pied patterning, flecks and restricted patterning. Swiss-based goats are not pied or spotted or flecked, and do not have stars (a white forehead patch) or frosting (grey muzzle). However, the British Toggenburg may be roaned; the Boer goat has the allele for belted, and the Pygmy goat is multi-coloured with the alleles for frosting and a white forehead. It is useful, therefore, to know as much as possible about the 'exotic' history of individual feral goat herds when deciphering the origin of various colour patterns and markings.

The effect of swiss patterning on the colour patterns

Swiss markings or patterning is very well known, it being the colour pattern of the British Toggenburg, British Alpine and a significant number of non-pedigree goats of Swiss type.

As a colour pattern it is always black, with white to tan trim, although the effect of the brown allele at the brown locus turns the black to brown- as seen in the Toggenburg and British Toggenburg.

Swiss markings have the following white areas: legs, ear, facial stripes from above the eyes to and including the muzzle; perineum; underside to the tail. The belly is dark (black or brown according to body colour).

A second colour pattern is White belly Swiss markings. This is like the standard Swiss Markings with the exception that the belly is white. . This exact patterning can appear as a phenotype when a Swiss Markings is crossed with a Lightbelly.

As Swiss Markings have an extreme of white trim (larger areas of white patterning than in other colour patterns of this kind), it is always possible to distinguish a Swiss Markings X other agouti pattern. Thus, if a goat has white ears, facial stripes, muzzle and legs, it has Swiss Markings in its genotype.

Easy recognition chart

Black body, belly and legs

- | | |
|-------------------------------|-------------------|
| 1. Head all black | <i>No Pattern</i> |
| 2. Head black with tan cheeks | <i>Red Cheeks</i> |

Reddish black body and belly; black legs

- | | |
|--------------|-----------------|
| No variation | <i>Mahogany</i> |
|--------------|-----------------|

Black body, white belly, striped legs

- | | |
|------------------------|------------------------|
| 1. White eye marking | <i>Lightbelly</i> |
| 2. White face stripe | <i>Face Stripe</i> |
| 3. Leg stripe reversed | <i>Lateral Stripes</i> |

Grey body

- | | |
|------------------------------|------------------------|
| 1. Grey belly and legs | <i>Grey</i> |
| 2. Black belly and legs | <i>Grey Dark Belly</i> |
| 3. White belly, striped legs | <i>Grey Lightbelly</i> |

Tan body

- | | |
|------------------------------|-------------------|
| 1. Black belly and legs | <i>Dark Belly</i> |
| 2. White belly, striped legs | <i>Bezoar</i> |

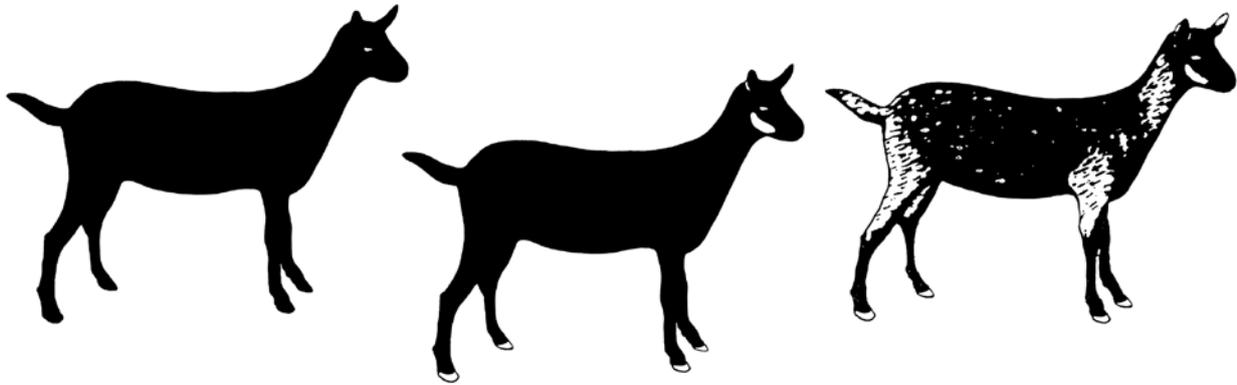
White body

- | | |
|------------------------------------|-------------------|
| 1. All white | <i>White</i> |
| 2. Black head pattern, back stripe | <i>Black mask</i> |

White patching or patterning on a dark goat

- | | |
|-------------------------------|--------------------------------|
| 1. Entirely random, | <i>Random spotting/piebald</i> |
| 2. White belt round middle | <i>Belted</i> |
| 3. Black forequarters only | <i>Cou noir</i> |
| 4. Black ticks on white areas | <i>Ticked</i> |

Colour Pattern Chart 1: Black coat, black legs



No Pattern or Black

Entirely black with no tan or white patterning. Longer hair may fade in sunlight.

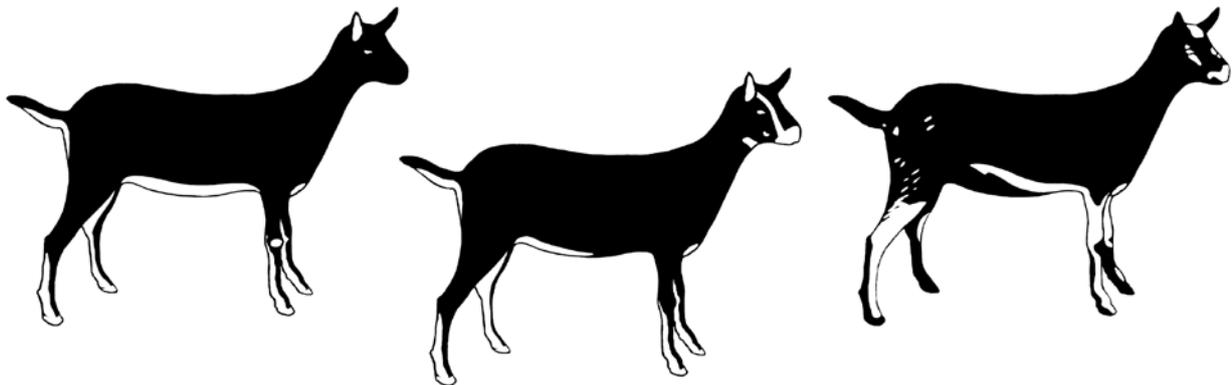
Red Cheeks

Black with tan cheeks, tops of the ears and back of the thighs. Size of the cheek markings may vary, along with its shade and intensity.

Mahogany

The coat is actually a mahogany (tan) and black roan, appearing very reddish to almost black in variable lighting. Cheek patches, the tops of the ears and the thighs are tan.

Colour Pattern Chart 2: Black coat, striped legs



Lightbelly

Has the following white areas: insides to the ears; diamond shaped eye patch; throat patch; belly; perineum; underside to the tail and perineum, along with leg stripes.

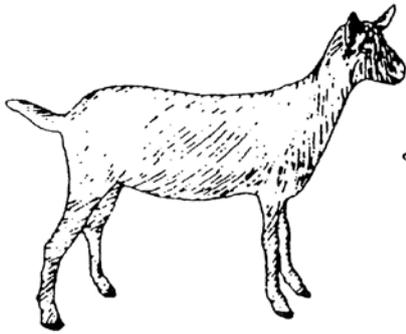
Face Stripes or Eyebars

Very similar to Lightbelly, although there is a complete face stripe from above the eye to the muzzle, and slightly less complex leg striping.

Lateral Stripes

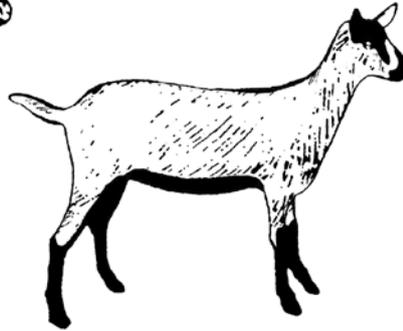
The leg stripes are reversed (white anterior), the belly is only partially white, and the face stripes are only partially formed.

Colour Pattern Chart 3: Grey coat, black or striped legs



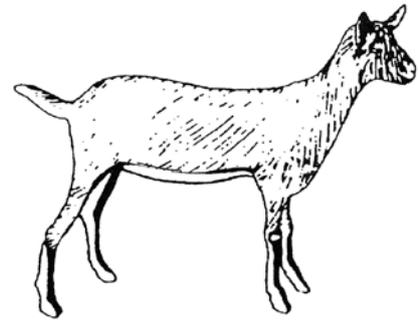
Grey

Variable in shade. sometimes with slightly darker head and legs.
Belly grey.



Grey Darkbelly or Blue

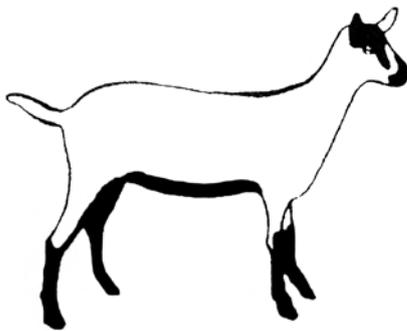
Black legs; belly; rump; back and shoulder striping; face markings.
This is a grey version of the Tan Darkbelly or Badger Face colour pattern.



Grey Lightbelly

Exactly like the Lightbelly (black coat) but the pelage is grey instead.
Is a genotype in sheep, and may also be so in goats. This pattern is also produced by a Grey Darkbelly X Lightbelly.

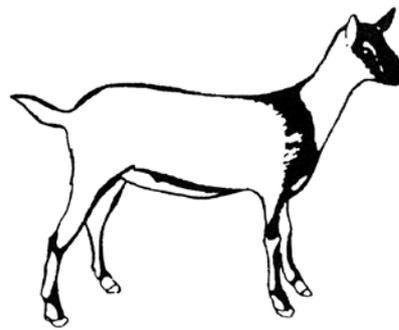
Colour Pattern Chart 4: Tan body, black legs



Badgerface or Dark belly

Black trim affecting the belly; lower legs and insides to the legs; a back stripe and shoulder stripe; facial striping above the eye and to the nose. Chin and throat also black, continuing down the bottom border of the neck. In this colour pattern, the body may dilute to white.

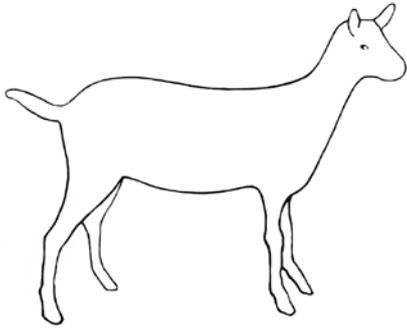
Colour Pattern Chart 5: Tan body, striped legs



Bezoar or Wild Patterning

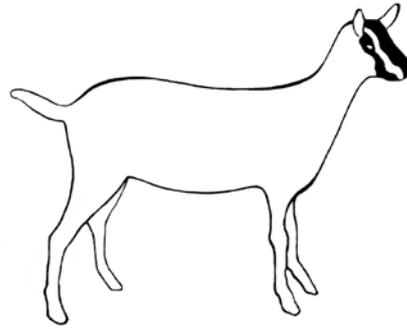
The coat is tan, the trim being the exact patterning of the Wild Goat. Black areas are: facial shading; rims to the ears; back and shoulder stripes; bottom edge of the neck. Males are darker, and the females may lack the chest and shoulder striping. White trim amounts to: face stripes from above the eyes to the nose; belly; perineum; insides to the legs. Leg stripes are a prominent feature. In this colour pattern, the body may dilute to white.

Colour Pattern Chart 6: White or nearly all white



White

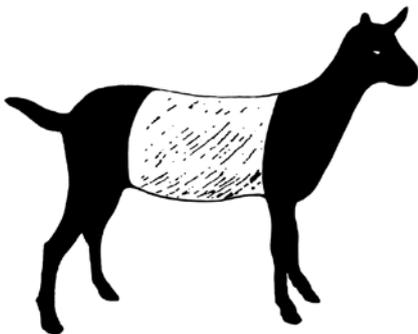
As white is a dilute tan, a white goat may be any colour/shade from stark white (Saanen white), through cream, yellow and gold, to red. Some white goats may have shading on the face, shoulders or legs (called shadow markings). It is likely that stark white is the homozygous expression of white, and a light sandy roaning the heterozygous expression.



Black Mask

Black Mask is white with only black head and face stripes, black brisket and back stripe. Black Mask, like white, may be tan rather than white.

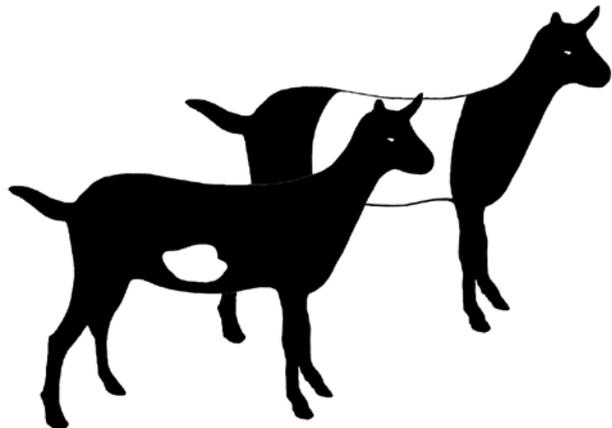
Colour Pattern Chart 7: Ticking on white



Ticking on white

Can occur on any white areas, in this case Belted.

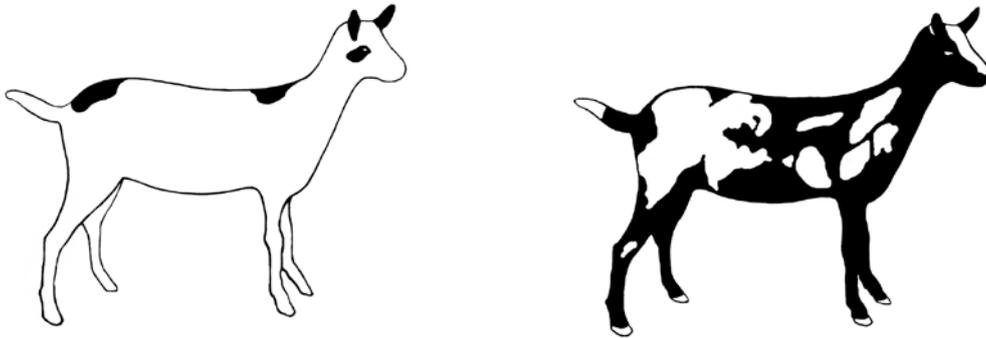
Colour Pattern Chart 8: Belted



Belted

Typically a white ring around the barrel. the belt may be incomplete (side panel, side spots that are usually lower down). May be large enough to include the legs, rump, shoulder and neck.

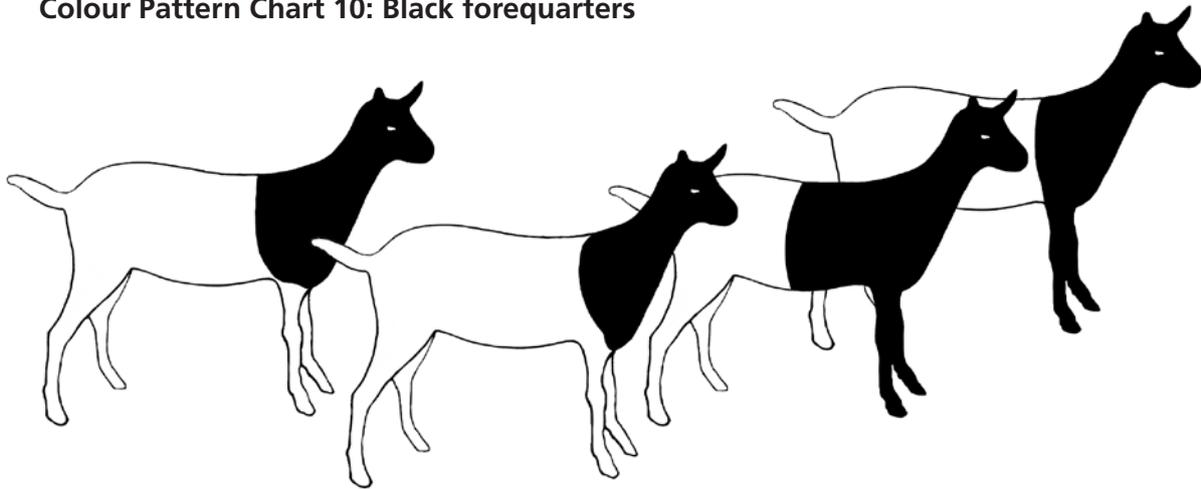
Colour Pattern Chart 9: Random spotting or Piebald



Random spotting or Piebald

Varies from black with a few white hairs to white with hardly noticeable black spots. Edges typically smooth and rounded. When resembling belted, there is usually white on the head and feet.

Colour Pattern Chart 10: Black forequarters



Cou Noir

The head and forequarters are black, and body and legs white.

Wuan

In the Wuan pattern the black ends at the front of the front leg, not behind, as in Cou Noir.

Schwarzhals

The Schwarzhals pattern has black forequarters and half the barrel, along with the front legs. In the **Vellesana** variant of Schwarzhals, the black ends at the elbow.

The Bagot pattern is commonly said to be like the Schwarzhals, although it is very variable and may be like any of the foregoing with or without black front legs. A possibility is that the Bagot goat may have a black forequarters pattern along with random spotting.

To date it is not clear which of the above (apart from Cou Noir) are distinct patterns or variants.

Alternative names for colour patterns

Lightbelly	<i>Black and tan. (See note below)</i>
Face stripes	<i>Eye bar. Striped light belly. Light eye bar. (See note below)</i>
Grey lightbell	<i>None</i>
Grey	<i>None</i>
Grey darkbelly	<i>Blue. Probably also synonymous with agouti grey; grey agouti; pygmy pattern</i>
Bezoar	<i>Wild patterning</i>
Dark belly	<i>Badgerface. Chamoisee. Oberhasli pattern</i>
No pattern	<i>Black</i>
Mahogan	<i>None</i>
Red cheek	<i>None</i>
White	<i>Cream. Tan. Red</i>
Black mask	<i>Abbreviated buckskin. Dorsal stripes. Eel stripe. Facial and dorsal stripes</i>
Lateral stripes	<i>(See note below)</i>
Swiss markings	<i>Swiss patterning. Toggenburg</i>

Note: lateral stripes, light belly and face stripes are all confusingly called 'sundgau'