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Alpine pasture and breeding project *‚Alpines Steinschaf'*

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The *‚Alpines Steinschaf'* is one of the most endangered sheep breeds, which has noteworthy, remaining stocks in Bavaria, Baden-Württemberg and Salzburg. Over years the '*Alpines Steinschaf'* had to adapt to sparse and stony soils, long and snowy winters as well as to high precipitation amounts in the Alps. But not only its adaptation to a wide range of extreme climatic and environmental conditions, but also its genetic origin gives the sheep an important cultural value that needs to be conserved. This article describes the Alpine pasture and breeding concept of the breed *‚Alpines Steinschaf'*. This project reintegrated traditional Alpine husbandry and the best young rams of one age group which were tested for performance on pasture under given extreme environmental conditions.

Breeding history

The *‚Steinschaf'* plays an important role in the agricultural history as it is a historical Bavarian sheep breed. WASSMUTH and MITARBEITER (2000) discovered by means of random blood tests on breeds of the Bergschaf and forest sheep that the *Steinschaf* originated despite of different cross breedings from the Neolithic *‚Turfschaf'*. In the past it inhabited the whole Eastern Alpine region. Today's breeds of the Steinschaf developed from a few remaining populations.

Breed description

The *Alpines Steinschaf* is a smart, small to medium-sized Alpine sheep, with a broad and compact framed body. Typical for this breed as is the dual coated fleece, with pithy, long coarse hair, fine wavy and short bottom hair. In addition, the above-average amount of wool grease prevents soaking resulting from rainfall. The long wool has a fibre diameter of 38-42 microns. Generally, twice a year the Steinschaf is shorn. All colour variations can occur.

Performance

The Alpines Steinschaf is well adapted to rough weather conditions of high locations. The small and delicate sheep is a agile climber and is well suited for grazing of rocky and exposed alpine regions. The breed has a high fecundity and a good feed conversion. Because of unseasonal heats lambing occur twice a year where twin births are common. Ewes are even if they are fed badly in heat four weeks after lambing (fertility 180-200 %). Positive maternal ability with a high milk performance and low susceptibility to mastitis guarantee a secure rearing of lambs.

Due to the slender body one can obtain a comparably high dressing percentage. The quality of the finely fibres meat similar to wild game makes it special compared to meat from mutton sheep. Therefore the *Steinschaf* provides high quality lamb meat. Ewes weigh 45 to 60 kg, rams 60 to 75 kg.

Breeding status quo

In Bavaria the stud book started in 1997. In February 2000, in the whole Alpine region 11 breeders, thereof four from Bavaria had a total of 130 ewes of the lineage of 6 rams, which were registered in the stud book. On October 9th 2004 a working group of *Steinschaf* breeders was found. The stock of the Alpine *Steinschaf* currently includes 600 ewes that are registered in the herd book from 36 breeding farms in Germany (1.1.2013). An important supporting factor for this achievement was the

state premiums for sheep farming amounting for 30 € for each registered sheep in Bavaria. The Federal Office of Agriculture and Food (2008) listed the *Alpines Steinschaf* on the red list under 'conservation status', which means that in Germany the effective population size is between 50 and 200 sheep. In order to conserve this size, breeding programs oriented on the genetic conservation have to be developed, cryoreserves have to be generated and monitoring has to be conducted.

Alp project

Apart from the Werdenfelser Land, Alpine farming with sheep only plays a minor role in Bavaria. Around 3000 sheep are grazing on the Alps, around 1 % of 270.000 sheep in Bavaria respectively. The Bavarian State Institute for Agriculture (LfL) at the Institute for Animal Breeding in Grub used the Interreg-Project "Activating alpine pastures – new ways to diversify" of the Bavarian Academy for Nature Conservation and Landscape Management (ANL) to establish a special breeding project with an endangered sheep breed. Focus of the project thereby is the reclamation of the Kleinrechenbergalm by the grazing of young rams of the endangered breed *Alpines Steinschaf*. It is an alp that has not been in use until 2010 for fifty years and is located in the district of Traunstein in Upper Bavaria.

The Kleinrechenbergalm (Table 1) encompasses 3,0 ha and its pasture provides enough forage for 15-16 sheep. At the beginning of the year this year's rams are being chosen. At the end of May the owners transport their rams to the LfL in Grub. This is the place where they can get accustomed to one another and to resolve upon their hierarchy. Afterwards, the rams are weighed, dewormed and their claws are being cut uniformly. In the middle of June, the driving to the Alpine pastures is taking place. During the pasture period the breeders do weekend checks in turns, which includes amongst others the checking of the rams, inspections of the fences and maintenance of the Alpine cabin.

Table 1: Facts about the "Kleinrechenbergalm"

Facts about the ‚Kleinrechenbergalm'	
Size:	3,0 ha
Altitude:	approx. 1.400 m a.s.l.
Alp season:	approx. 12.06. – 25.09.
Alp owner:	Bavarian State Forestry, Forest management Ruhpolding
Access:	partly by car, afterwards follows a 45 minutes walk
Alpine cabin:	existent (not managed, no catering)
Fencing:	permanent fence with 4 strands (power supply: solar module)
Water supply:	well and emergency tank (1200 L)

Almost 100 days later sheep return from the Alpine summer pasture – the pastures have been grazed and the rams are in breeding condition. About noon, the rams will have succeeded the descending and are acclaimed by the village. Afterwards, the licencing and auction of the rams is taking place, where the audience gets useful information about the breed and can ask questions. Furthermore, the majority of rams find new owners and thereby bloodline exchanges between the breeders are guaranteed. Lamb meat and wool products are sold.

Breeding project

The breeding project is in operation since 2010 within the framework of the newly approved pilot project: 'Infrastructure for the nationwide breeding of endangered farm animals'. This project was submitted by the Society for the Preservation of old and endangered Breeds (GEH). Within the framework of this project, an alp index, wool examinations and an information stand about the Alpine Steinschaf in the National Park in Berchtesgardener Land has been established.

Preconditions for the alpine summer pasture are:

- Age: 1- 1,5 years
- Max. 2 young rams of one breeding flock
- Max. 1 young ram of one sire and breeding flock
- Breeders should actively participate in the project

The rams develop and grow well under the same environmental conditions even if the grazing quality is at an average. On the day of the returning from the alpine pasture they reached on average a weight of 59,0 kg with a standard deviation of 7,7 kg. They therefore gained during the summer season on the alpine pasture a weight of on average 5,3 kg with a standard deviation of 4,8 kg.

On the day of returning for each ram an own alp index was calculated (Table 2):

Table 2: The alp index of 60 rams from 2010 until 2013

Data	Weight gain in kg	Grade weight gain	Grade hoof quality	Grade wool quality	Grade muscling	Grade Over all type	Grade Ranking best 10	**Alp index** (sum of grades)
Mean	5,3	10,1	14,3	14,3	14,6	13,3	3,7	**69,4**
Stand. dev.	4,8	4,8	2,6	1,8	1,2	1,6	3,5	**8,2**
Min.	-6,5	1	8	10	12	10	0	**48**
Max.	20,5	18	18	18	16	16	10	**92**

- Weight gain during the alpine summer pasture (evaluation for each age group, mean 10, standard deviation 5, limited to 1-18 points)
- Claw quality (grades 1-9, times 2)
- Wool quality (grades 1-9, times 2)
- Muscling (grades 1-9, times 2)
- Over all type (grades 1-9, times 2)
- Ranking of the rams (First place = 10 points … 10th place = 1 point, further places 0 points)

The weight gains are only compared for the time the rams graze on the alpine pasture, as each year there are different environmental and grazing conditions. Additionally, differences can also occur due to fighting. The weight gains are transformed into a grade, where the mean is 10, the standard deviation is 5 and the scale range is 1 to 18. The final weight is not taken into consideration, as the aim is not to change the weight level.

The criteria for claw and wool quality, muscling and external appearance is judged subjective by a jury team. For the first time claw quality is included into the award of premiums. Uniform abrasions are evaluated positively and connotation as well as enclosures negatively. All four criteria are being evaluated according to the 9-points-scheme and the directives of the execution of zootechnical legislation. Grade 1 denotes very bad, grade 5 is average and grade 9 is excellent. In order to get the Alp index, the grades are multiplied by two.

A ram can reach maximum 90 points in the first five criteria. Finally, the best 10 rams that are typical for the breed are being ranked. The first place ram receives 10 points, the 2nd place 9 points and so on, until the 10th place only receives 1 point. Therefore the best ram can at most reach 100 points. The best three rams every year lay between 73 and 92 points.

The criteria for behaviour and fitness can also be integrated in the Alp index. However, only a few abnormalities were detected and gave no reasonable evaluation. Therefore these criteria are only

written down to remarks. Until now, only 4 out of 60 rams had conditioning problems during the descending, 4 rams were conspicuously shy and one was injured.
On average in the first four summer pasture years in each year 10 rams were auctioned by an average price of 350 Euros. The top price was 700 Euros in 2012.

Conclusions

The first positive effects on the breed *Alpines Steinschaf* are already visible: Health and fitness of the rams increased, the best rams showed under the harsh conditions in the alps very good weight gains and all in all the breeding quality of the rams has clearly increased.

Within the last five years, the *Alpines Steinschaf* gained new accessions, the total stock in Germany more than doubled. Particularly gratifying was that due to the extremely positive response about the project numerous new breeders started breeding of the *Alpines Steinschaf*. Many committed breeders identify themselves with the Alpine pasture and breeding project of the *Alpines Steinschaf*.

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More information about the project ‘Activating alpine pastures’ is on the website: www.almenvielfalt.com

More information about the project ’Infrastructure for the nationwide breeding of endangered farm animals’ is on the website: www.g-e-h.de