View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Organic Eprints

Aspects of Applied Biology 79, 2006
What will organic farming deliver? COR 2006

Do endangered sheep breeds have an advantage in organic farming?

By G RAHMANN

Institute of Organic Farming, Federal Agricultural Research Centre, Trenthorst 32, 23847 Westerau, Germany

Summary

Endangered breeds are not compulsory for organic farming, but adapted and local breeds are considered suitable for Organic Farming. In the year 2001, 240 ewes of six different breeds were introduced on the experimental farm of the Institute of Organic Farming in Trenthorst. Two were high yielding breeds, four older endangered German breeds. The whole herd was kept in one herd in a low input – low output system, comparable to agri-environmental schemes. The scientific programme was to follow the herd's development in terms of health status, growth rate and product qualities.

After three lambing seasons, no real advantages could be found for the old breeds. Nevertheless, high yielding and old breeds did not show big differences in production and health performance. The result is, that even in low intensive organic farming systems, old and endangered breeds need financial support to be competitive with high yielding breeds.

Key words: Sheep, rare breeds, organic farming, Germany, agri-environmental schemes

Introduction

Many domestic livestock breeds are endangered (Rahmann, 1997). The International Biological Commitment IBC has forced National Governments to support and protect the genetic resources in situ (Rahmann *et al*., 2001. Endangered breeds are not compulsory for organic farming, but adapted and local breeds are considered as suitable for organic farming (EU-Regulation 2092/91). But organic farmers are not at all convinced that old and endangered breeds are favourable for their livestock activities (Rahmann & Nieberg, 2005). Therefore, primarily high yielding breeds, and rarely local and endangered breeds are kept on organic farms throughout Europe. Until now, there has been no scientific confirmation that old breeds are more favourable for organic farming than high yielding breeds. Biotope management with livestock under organic farming conditions should be the most favourable condition for the advantage for rare old breeds. If not there, where else?

To give an answer about the potential of endangered breeds in organic low input – low output systems, a sheep flock of 250 ewes of two high yielding and four old sheep breeds was established in 2001 at the organic experimental research station of the Institute of Organic Farming in Trenthorst (Northern Germany). All sheep were kept under same conditions in one flock. They were kept without concentrate feeding, just two months indoors, without tail trimming and with

medium roughage quality of the sward in the summer season (agri-environmental scheme). The flock was assessed for its health status and its production performance over three years. The target was to show whether there are any economic or other advantages (health, product quality) to keeping endangered breeds instead of high yielding breeds on organic farms.

Materials and Methods

In the year 2001, a sheep herd of different breeds was established at the organic research farm of the Institute of Organic Farming in Trenthorst (Northern Germany) (Rahmann, 2002). To test the suitability of the breeds for agri-environmental schemes under organic standards, one high yielding breed (German Blackface sheep) and three endangered German breeds (Rhoen sheep, Coburger sheep, Bentheimer sheep) were used. All ewes were born in 2001 and came as lambs to the experimental farm. Every breed had between 40 and 50 ewes. The whole herd was kept in one herd in a low input – low input output-system, comparable to agri-environmental schemes (Rahmann, 1997). The sheep were kept on medium productive grassland (Fig. 1a). The vegetation on the 30 hectares was defined as Ranunculo alopecuretum geniculati with 98% grass, 1% legumes and 1% herbs in biomass (appraisal with method Klapp & Stählin, 1965). The stocking rate was about one animal unit per hectare and year. The sheep received no concentrate feeds throughout the year. Mineral blocks and clean piped water were offered *ad libitum.*

Only in the lambing season in March/April were they kept indoors to avoid lamb losses due to raptors (crows). The lambs were kept with their mother until autumn. Winter feedstuff was produced on the same experimental grasslands as hay and silage. The flock was shifted every three weeks to new plots to reduce endoparasite infection.

Fig. 1. (a) The sheep flock on the 30 hectare experimental grassland in Trenthorst, Germany; (b) Weighing of the sheep on the experimental grasslands.

The scientific programme was to follow the herd's development and performance in an organic agricultural scheme. The animals (ewes and lambs) were weighed monthly (see Fig. 1b) after 6 hours without fodder. The health and the reproduction parameters have been documented.

Results

Productivity

One of the most important production parameters for sheep keeping is the number of weaned lambs per ewe per year. All ewes are considered (even the ewes that did not give birth) and lambs are declared as weaned with 52 days after birth, even if they suckle longer.

In Table 1 the development of the flock is described. The first lambing was difficult (all ewes had deliveries in Spring 2003 deliverance and many of them had difficulties due to uterine prolapse. The old breed Bentheimer sheep suffered most of all. All ewes were replaced by offspring from 2003. That is why in 2004 no Bentheimer sheep gave birth. In the third lambing year 2004 the herd was well established. The number of weaned lambs per ewe and year was better for old breeds than for the high yielding breed. This advantage continued in 2005.

Table 1. *Production figures of the experimental sheep flock at the organic research station in Trenthorst 2003 to 2005*

	No. ewes	Lambing rate	Fertility rate	Mortality rate	Productivity rate
2003					
Bentheimer sheep	37	1,32	100%	4%	4%
Coburger sheep	42	1,54	98%	10%	10%
Rhoen sheep	43	1,56	84%	5%	5%
German blackface	43	1,50	84%	15%	15%
Total	165	1,46	97%	9%	9%
2004					
Bentheimer sheep	0				
Coburger sheep	36	1,55	92%	14%	14%
Rhoen sheep	35	1,76	97%	8%	8%
German blackface	34	1,86	85%	2%	2%
Total	105	1,72	91%	8%	8%
2005					
Bentheimer sheep	16	1,87	94%	4%	4%
Coburger sheep	36	2,03	89%	12%	12%
Rhoen sheep	41	1,78	100%	5%	5%
German blackface	37	1,71	92%	3%	3%
Total	130	1,84	94%	7%	7%

The number of lambs / ewe / year is not the only parameter for successful production. The weight gain in summer is more important. When lambs are sold in autumn, 40 kg is the minimum live weight for abattoirs. If the ewes do not have enough milk, the growth performance of lambs is influenced, particularly in grassland systems where no concentrates are fed. Two lambing seasons (2003 and 2004) have been used to assess the weight gain. Weaning time in September (mating season) has been used to show the results. Only lambs were considered which were in the same age group and comparable between the two years.

Weight development of lambs

In Table 2 it is observable that the lambs of the high yielding breed German blackface did grow better. The Coburger sheep and the Bentheimer lambs showed medium weight, while the Rhoen lambs were the worst breed. The male German blackface lambs were 36% (2003) and 39% (2004) heavier than Rhoen lambs. The difference was not so high between the female lambs (26% and 27%). Not one of the lamb was ready for selling and all needed to achieve a finishing live weight

of 40 kg. A daily weight gain of 300 grams for about 4 to 6 weeks is necessary.
Higher fertility rates of rare breeds did not compensate their lower growth performance compared to the high yielding German blackface. All breeds were without any significant difference in lamb production per ewe measured in kg live weight of the lambs (Table 3). The carcass quality of rare breeds is generally lower than high yielding breeds (Rahmann, 1997; Rahmann *et al*., 2001).

Table 2. *Average live weight of lambs of different breeds in September 2003 and 2004 at the research station in Trenthorst / Northern Germany*

	September 2003			September 2004		
	n	average	var.	n	average	var.
	male	kg	kg	male	kg	kg
Coburger lambs	21	26,84	5,8	12	33,43	4,3
Bentheimer lambs	11	29,07	4,9			
Rhoen lambs	17	24,36	4,9	17	24,36	4,9
German blackface lambs	13	33,22	7,9	19	33,94	4,1
Total	62	27,85	6,6	48	31,80	4,2
	female			female		
Coburger lambs	21	27,83	4,8	19	29,48	4,2
Bentheimer lambs	17	31,98	5,3			
Rhoen lambs	22	23,56	5,1	25	25,51	2,9
German blackface lambs	22	29,75	6,5	14	32,30	4,9
Total	82	27,08	5,9	58	28,45	4,7

Table 3. *Lamb production per ewe of different breeds in 2003 and 2004 (kg live weight per ewe in September)*

	Kilogram live weight of weaned lambs / ewe (September)			
	Annual productivity rate of the breeds		Average productivity rate of the breeds between 2003-05	
	2003	2004	2003	2004
Coburger lambs	37,77	36,03	29,23	41,38
Bentheimer lambs	40,62	0,00	33,38	0,00
Rhoen lambs	29,04	40,82	25,06	38,16
German blackface lambs	31,83	50,35	31,11	43,92
Total	34,79	41,46	28,52	40,97

Discussion

After three lambing seasons, no real advantages could be found for the old breeds. Nevertheless, high yielding and old breeds did not show big differences in production and health performance. The conclusion is, that even in low intensive organic farming systems, old and endangered breeds need financial support to be competitive with high yielding breeds.

References

Rahmann G. 1997. Contribution of rural tourism to the markets for livestock products in LFAs in Germany. In *Livestock systems in European rural development,* pp 55–60. Eds J Laker and J A Milne. First conference of the LSIRD network, 23-25 January 1997. Craigiebuckler, Aberdeen, Scotland : LSIRD network/Macaulay Land Use Research Institute,

Rahmann G. 2002. The standards, regulations and legislation required for organic ruminant keeping in the European Union. *EAAP Publications* **106**:15–26