DIFFERENCE OF DISEASE RESISTANCE BETWEEN MONGOLIA SHEEP AND GERMAN MUTTON MERINO

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INTRODUCTION

Disease resistance is a major component of the economic efficiency of mutton sheep production. For comparing the production performance with Mongolia sheep and using heterosis, some foreign mutton sheep, including German mutton merino (1995), Polled Dorset (1996), Suffolk (1997), etc., were imported into Inner Mongolia grassland, China, in the nineties. In this new environment, some diseases influenced the performance were become more important and others less important depending on the climate, the condition of pasture land, the standard of husbandry and the ability of humans to avoid, control and treat the problems created. Where conventional control measures, such as vaccination and chemotherapy, were either ineffective, unsustainable or uneconomic, genetic approaches were considered (Raadsma *et al*., 1997 ; Baker, 1999). The fundamental definition of 'disease resistance' in this paper were reduced parasite burdens or lower incidence of diseases (in the same environment).

This study was devoted to describing breed differences or genetic variation in resistance to sheep diseases between Mongolia sheep and German mutton merino sheep on the Mongolian Plateau.

MATERIAL AND METHODS

Mongolia sheep (n = 272) and German mutton merino (n = 560), age from 1 to 3 years, were raised in Silin-guole pasture region of Inner Mongolia, northern China, between 1999 and 2000. For these two mutton sheep breeds, the incidences (%) of foot-rot, digestive tract diseases, dystocia, stillbirth, retained placenta, mastitis, brain worm, nose bot fly, vagina bot, urethra bot, the eggs per gram fecal (EPG), infection rates (IR, %) of gastrointestinal nematode parasites (*Nematodirus*) were checked separately in the field and veterinary lab, Inner Mongolia Agricultural University. Some behavior of defending nose bot fly in Mongolia sheep was observed.

RESULTS AND DISCUSSION

Significant differences in disease incidence (table 1) and in the infection rates and the EPG of gastrointestinal nematode parasites (*Nematodirus*) (table 2) between these two breeds were shown. Most items of Mongolia sheep were better than that of German mutton merino sheep. It was indicated that the performances of disease resistance of Mongolia sheep were better than that of German mutton merino sheep. As compared with German mutton merino, clearly, Mongolia sheep carried reduced parasite (*Nematodirus*) burdens and showed lower incidences of some diseases on the same conditions (table 1).

Table 1. The incidence of diseases (%) in mature Mongolia sheep and German mutton merino sheep in 1999-2000

	Breeds	
Disease	Mongolia	German mutton merino
Foot-rot	4.2	20.0
Digestive tract diseases	5.8	18.0
Dystocia	1.9	11.8
Stillbirth	2.2	15.8
Retained placenta	3.0	17.5
Mastitis	1.5	16.4
Brain worm	1.8	12.6
Nose bot fly	46.7	100.0
Vagina bot	0.0	33.3
Urethra bot	7.7	60.7

There were many reports on variation among breeds of sheep in resistance to some common infection diseases and internal parasites, such as *Haemonchus contortus, Ostertagia spp* and *Trichostrongylus spp* (Gray and Woolaston, 1991) A number of indigenous 'unimproved' breeds of sheep on Mongolian plateau, such as Mongolia, Wuzhumuqin, Sunite, etc. (Zhang and Bilig, 1998) appeared to be significantly resistant or tolerant to Foot-rot, Digestive tract diseases, Mastitis, Brain worm, Nose bot fly, Vagina bot, Urethra bot, etc., compared with some imported mutton or wool breeds.

However, in sheep, there were few reports on the heritability estimates of resistance to these diseases. The heritability of resistance to foot-rot and to fly strike for Merino was 0.15-0.29 and 0.10- 0.58, respectively, the heritability estimates of resistance to endoparasites (assessed in terms of either FEC or PCV) were from Merino or Romney sheep in Australasia (Gray and Woolaston, 1991).

Table 2. The IR (%) and the average EPG of *Nematodirus* parasites of the lambs and mature sheep in the two breeds (June – August, 2000)

Test week	Infection rate (IR)				Eggs per gram fecal (EPG°			
	Lamb		Mature		Lamb		Mature	
	MS	GMMS	MS	GMMS	MS	GMMS	MS	GMMS
1	0.0	13.0	36.7	33.0	0.0	100.0	145.4	240.0
2	16.6	43.0	36.7	33.0	280.0	515.4	200.0	150.0
3	34.0	53.0	36.7	40.0	400.0	766.7	145.5	250.0
4	26.7	60.0	40.0	40.0	512.5	833.3	266.7	450.0
5	36.7	70.0	40.0	43.0	754.5	1066.7	350.0	492.3
6	36.7	76.0	40.0	43.0	790.9	1443.5	316.7	430.8
7	43.0	76.7	36.7	36.7	984.6	1782.6	290.9	454.5
8	40.0	80.0			991.7	1570.5		
mean	29.2	58.9	38.1	38.4	589.3	1009.8	245.0	352.5

MS : Magnolia sheep ; GMMS : German merino mutton sheep

How these breed differences in the two kinds of sheep were inherited and which were controlled with major genes or with poly genes were still unknown. We are studying these subjects deeply in China since 2000.

CONCLUSION

The incidences of diseases and/or the infection rates of foot-rot, digestive tract diseases, mastitis, brain worm, nose bot fly, vagina bot, urethra bot, etc., and the EPG of gastrointestinal nematode parasites (*Nematodirus*) in the population of Mongolia sheep were much lower than that of German mutton merino sheep under the same condition in Mongolia plateau. These breed differences on disease resistance between Mongolia sheep and German mutton merino sheep might correspond to a genetic variation and have a possible to use them in improving production performance of mutton sheep. Further research on the genetic component of the disease resistance of Mongolia sheep is needed.

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