CURRENT TRENDS IN HELMINTH PARASITE CONTROL IN SMALL RUMINANTS IN MALAYSIA AND SOUTH EAST ASIA

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ABSTRACT. Parasitic helminth infections in small ruminants are prevalent in South East Asia (SEA), limiting productivity and causing major economic loss for farmers. The hot, wet, tropical climate all year round favours trichostrongylid infections, predominantly haemonchosis in sheep and goats. Commercial large scale farms, with more than 300 animals, as well as small holders or backyard farmers with less than 50 animals face the debilitating effects of haemonchosis when they graze their animals as effective worm control is often hampered by anthelmintic resistance. In Malaysia, frequent and indiscriminate use of anthelmintics in the past has resulted in the majority of the small ruminant population facing resistance to one or more anthelmintics. Several alternative methods of worm control are being employed by farmers; the most important and effective being cut and carry or zero grazing, where the animals are kept in pens and grass is cut and fed. In Cambodia and Myanmar, ruminants are still tethered or stall fed with minimal drug use. In Indonesia and Thailand, commercial goat and sheep farms are fast expanding to produce breeder stock for the SEA market. However, up to 75% of the small ruminant population is still traditionally managed by small scale farmers.

In most of SEA, the McMaster method for faecal worm egg counts is the only diagnostic test used to assess helminthosis in ruminants. There is an urgent need to increase awareness and information on the need for testing faecal samples regularly before drenching, conducting faecal egg count reduction tests on a yearly basis, use of the FAMACHA technique to enable selective treatment of individual animals The use of alternative worm control methods to manage helminthosis will help promote effective ruminant production with reduced drug use and encourage "green" farming methods. Extension of research on local bioactive plants which may have the potential to control helminthosis may also be beneficial in the longer term.

Keywords: helminth parasites, control, Malaysia, South East Asia

INTRODUCTION

The current trend in South East Asian livestock industries is towards greater commercialisation whereby smallholders and backyard farmers are finding it financially lucrative to expand and

commercialise their herds and flocks. Small farms of 10-20 animals traditionally kept as a backyard enterprise are fast disappearing especially in Thailand, Malaysia and the Philippines with Indonesia and Vietnam not far behind. Sheep and goats are especially important livestock commodities in Indonesia (11.0 million), the Philippines (2.1 million), Thailand (1.5 million) and Myanmar (1.1 million) as compared to Malaysia (DVS statistic, Vietnam Cambodia and Laos which have less than 300,00 head in each country (FAO, 2005)). The common breeds of small ruminants vary with locality and include the native breeds such as Siamese long tails in Thailand, Katjang goats in Indonesia and other hardy breeds that can tolerate the tropical climate and poor quality feeds. Imported breeds such as Commercial Merino Border Leicester crosses, Barbados Black belly and St Croix have found their way into the local populations with importations to upgrade the local breeds. Helminth parasites such as *Haemonchus contortus* and *Trichostrongylus* spp., followed in prevalence by *Strongyloides papillosus*, *Oesophagostomum* spp., *Moniezia* spp, *Trichuris* spp., *Cooperia* spp., *Bunostomum* spp., *Fasciola* spp. and rumen and pancreatic flukes, are commonly found in the Asian small ruminant production systems (Sani *et al.* 2004).

Studies by Chandrawathani *et al.* (1994 and 1995) evaluated the importance of helminth infections in small ruminants in Malaysia by estimating production increases after treatment with anthelmintics. Small ruminant farming is being constantly promoted by Malaysian government agencies in an effort to increase food production for the country, thereby opening up opportunities for goat and sheep farming under oil palm and rubber plantations. Several studies were conducted to support this effort such as epidemiological and production data, nutritional analyses, methods of pasture maintainance and worm control strategies for long term implementation at the smallholder level. The data generated was also very useful for the rest of South East Asia as the climate and geography in these countries had many similarities. This paper looks at the various methods of worm control practised in these Asian countries over the past decade and gives an insight into the future expectations and options for worm control in a changing environment.

WORM CONTROL METHODS FOR SHEEP AND GOATS PRACTISED IN ASIA

Strongyle infections, namely *Haemonchus* spp., is the major cause of helminth disease in South East Asia causing severe losses in terms of mortality and morbidity. In Malaysia, over the past 20 years, small ruminant helminths have primarily been controlled by anthelmintics which are used frequently up to 12 times a year. This has resulted in severe anthelmintic resistance in worm populations for the 4 drug groups namely benzimidazoles, avermectins,

levamisoles and salicylanilides (Chandrawathani, 1999, 2003; Dorny *et al.,* 1993, Sivaraj *et al.*) Consequently, an investigation into the total anthelmintic failure in small ruminants revealed the need to seriously look at alternative methods of helminth control in East Malaysian farms (Chandrawathani, 2004). Several methods were introduced to farmers facing anthelmintic resistance in their flocks as follows:-

1. Rapid rotational grazing: Following the success achieved by Barger *et al.* (1994), this method was introduced to Malaysian government farms with large acreage in pasture whereby a flock of sheep or goats is allowed to graze in a paddock for 3-4 days only after which the flock is moved to the next paddock. A series of 10 paddocks are utilised. The grazed paddock is left empty for at least 30 days to reduce survival of any existing larvae. Experimental work showed that this method was highly successful in maintaining low worm burdens (Chandrawathani *et al.*, 2004) and that the period without animals is sufficient for the grass to regrow and be ready for grazing with grass quality maintained between 10-15% crude protein. Service cutting was also done when necessary to maintain the pastures. Initial treatment with an anthelmintic was necessary to reduce pasture contamination during the first rotation, after which the faecal egg counts will be seen to be decreasing over time. This system needs strict management discipline to ensure effectiveness as any slackening in the implementation of the programme will cause a breakdown and increase in worm burdens (Barger, 1999).
2. Cut and carry or Zero grazing: This method is especially effective in smallholders who do frequent trading of animals. As sheep and goats are a source of ready cash, smallholders generally sell animals when they need cash and this leads to a lot of animal movement between smallholder farms. Traded animals may have strongyle infections and if grazed on common pastures after purchase, this can increase the infections at the destination. Farmers seldom quarantine or treat animals when acquiring new stock and this allows for regular mixing of helminth populations and leads to heavy infection levels. Thus with small numbers of animals, a cut and carry system is a workable measure to prevent infection as the animals are kept penned at all times and fed on cut grass with minimum exposure to pastures (Khadijah, 2006).
3. Improved nutrition: As improved nutrition has been implicated to positively affect worm infections, farmers are encouraged to improve the quantity and quality of feeding through the provision of supplements, concentrates, agricultural by-products which have been improved or silage, urea molasses blocks as well as planting

improved pastures for their animals (Knox and Wan Zahari, 1998).

4. Herbal remedies: The use of herbal remedies has been traditionally practised all over Asia and each country has its unique herbs and plants for use to control worms. However, the amounts and species of herbs used can vary according to region and this creates a dilemma for farmers who want to follow these practises as uniform guidelines for their use do not exist. In Malaysia, neem and cassava leaves have been shown to reduce worm burdens by 30% to 40% (Chandrawathani *et al.*, 2002 and 2006, Nurulaini *et al.*, 2009). Recently, the use of effective microbes has become popular and economical for worm control. Increased awareness on the need to reduce drug residues in food animals and promotions of healthy, green farming methods has sprouted several newage farmers keen on practising this.
5. Tethering: In many parts of Indonesia and Indochina where farmers have less than 5 animals, tethering has been found to be the management style of choice (http://www.fao.org/ag/AGP/AGPC/doc/Counprof/Philippines/Philipp.htm)
6. Biological control: This method has been proven to be effective. Reduced larval availability/ Reinfection rates by 80 to 90% (Chandrawathani *et al.*, 2003) but the product is unavailable at the moment. However, for the Asian market, issues relating to storage is critical as the hot wet tropical climate may pose a limitation to storage of the spores in feed or blocks, with the risk of sporulation. Trials done using this product was maintained and stored in refrigerators and is fed as a supplement added to concentrate, for grazing animals (Chandrawathani *et al.*, 1998 and 2002).

DIAGNOSIS AND ASSESSMENT OF HELMINTH INFECTIONS

In most of Asia, diagnostic tools for helminth infections are lacking. In Malaysia, the government-run laboratories conduct faecal egg counts and larvae culture as a routine procedure to help farmers identify potential problems and make recommendations of possible solutions. Extension services are responsible for assisting the development of new farmers and give free personalised service especially to farmers who are keen to commercialise their farming enterprise (Rajamanickam *et al.*, 1990).

The faecal egg count reduction test is a routine test conducted to encourage farmers to be aware about anthelmintic resistance issues and to resort to alternative methods of control (Khadijah, 2006). The Malaysian scenario for anthelmintic resistance is extremely grave mainly due to the abuse of anthelmintics over the past 2 decades. The tropical climate aggravated the problem of anthelmintic resistance by providing the perfect microenvironment for larvae development and survival all the year round and this was exacerbated

by a policy of indiscriminate grazing in communal grazing areas. Many times, treatments were then given without proper faecal egg count screening to diagnose infections.

In Cambodia, the faecal egg count technique is conducted in only one laboratory. Farmers seldom screen the animals for worm eggs and it is even more rare that treatments are given due to the economics. In this instance, it is highly probable that anthelmintic resistance is not prevalent.

In the Philippines and Thailand, commercialisation of the small ruminant sector for export and breeding has seen the development of various highly commercial enterprises that use an intensive management system, which does not necessitate grazing, thus reducing worm infections and the occurence of anthelmintic resistance. Parasitic diseases in these commercial facilities are minimal however, for smallholders who have 30-100 animals and graze their animals, parasitic disease is still a major limiting factor in small ruminant production (Barcelona, 1994).

One of the unique tools for assessing helminthiosis and currently gaining popularity is the use of FAMACHA which is an anemia guide, indicating a pale eye mucous membrane has a high probability of worm infections (reference needed). This is especially important in areas such as South East Asia where the main strongyle infection is *Haemonchus contortus*. Use of FAMACHA reduces the necessity of doing faecal egg counts to estimate worm burdens and is especially useful for smallholder farmers with few animals as they can monitor the helminth status of their animals regularly.

CONCLUSION

The Asian scenario for helminth infections appears to be seeing an upward trend in the severity of infections but there is also a marked improvement in awareness of diagnostic tests for helminth infection, knowledge of faecal egg count reduction test and anthelmintic resistance as well as a healthy view to reduced drug use and towards green farming (Chandrawathani *et al.*, 2009). Frequently, Asian farmers combine the various worm control methods to get the best possible advantage in raising their flock. As finances and facilities are the limitation, disease tends to take a back seat. However, with the increasing trend towards commercialization of livestock production, helminthosis is facing a new challenge from farmers who are aware and proactive to combating this problem.

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