

Some aspects of infectious diseases in small ruminants in Vietnam

Ngoc Thuy Do

National Institute of Veterinary Research - Vietnam

Introduction

Vietnam is a sub-tropical country located in South East Asia with a total area of approximately 330,000 square kilometers. Agriculture and rural development play a very important role in the economy and are foundations for general economic development and the implementation of modernisation and industrialisation. Agriculture contributes 30% to total export turnover and 24% of total GDP. The sector has provided improved living conditions for the majority of the 76% of the population that live in rural areas and created employment for over 60% of the national labour force (Office & Department of Agriculture, 2001; Le, 2002b; Vietnam, 2002). According to the statistics of the Ministry of Agriculture and Rural Development (MARD), animal production account for 26% of total agricultural output, and is now the country's second most important agricultural product, just after rice production (45%) (Office & Department of Agriculture, 2001).

Over recent years, the Vietnamese government have encouraged an expansion of sheep and goat populations in an attempt to increase domestic meat production. The development of small ruminant production has played an important role in the improvement of incomes for poor farmers and contributes not only to eliminate hunger but also reduce poverty in rural villages. The total number of small ruminants in Vietnam has been increasing rapidly. In 1990, there were 370,000 goats and is today about 600,000 heads. Sheep have been raised in central Vietnam (Phan Rang) for a long time, and are still undeveloped with a population of 3,000 in 1996, and increasing to around 16,000 in 2003 (FAO 1998; Khuc, et al. 2003; Vietnam 2002). In Vietnam, meat goats are mainly raised in the uplands, dry zones and mountainous areas with the most common feeding system being free grazing on land not used for crop production, whereas dairy goats are often raised in assigned pens and animals are usually hand-fed with grass or other green feeds. While goats are mostly raised in hilly and mountainous areas throughout the country, sheep are only adapted in Phan Rang province and Ba Vi district (Do et al., 2003). Effort to intensify production, however, has been seriously impeded by losses due to a wide range of infectious and non-infectious diseases.

The nature of disease

The term “disease” literally describes a state of “dis-ease” or “lack of ease”. This is a general term describing an abnormal condition of body structure and function, which is usually indicated by symptoms.

Disease is usually a complex interaction of several factors. Many factors may predispose to disease. Figure 1 describes the interplay of primary and secondary causative agents and their influence on immune system and disease processes. In addition, geographical and climatic factors also have a great influence on the occurrence of various diseases, particular on bacterial diseases. Some diseases can be extremely important in a given region or on a given farm but relatively insignificant at a national level. For examples, Australia is a free zone of FMD, while anthrax is very important disease of sheep and goats in this country (Adams, 1995).

A sick animal often shows one or more of the following signs: staying away from other animals, inactivity, hanging its head, loss or lack of appetite, fever, frequent thirst and shivers, stops chewing the cud, drooping ears and tails, rough coat, abnormal discharges like pus, mucus, constipation or diarrhoea. Thus, daily examination of animals in the herd is very important in order to look for any abnormal signs. An early recognition of a sick animal will help to make the treatment more effective and result in a prompt recovery.

A disease may be acute or chronic. Acute diseases often appear suddenly, last only for a short time, but are severe (e.g. Pasteurellosis caused by *Pasteurella multocida*). Chronic diseases last a long time, but are not usually severe (e. g. Fascioliasis caused by *Fasciola hepatica* and *Fasciola gigantica*). When disease occurs, it can have obvious and profound effects on sheep and goat production, or it can be sub-clinical, without obvious effects.

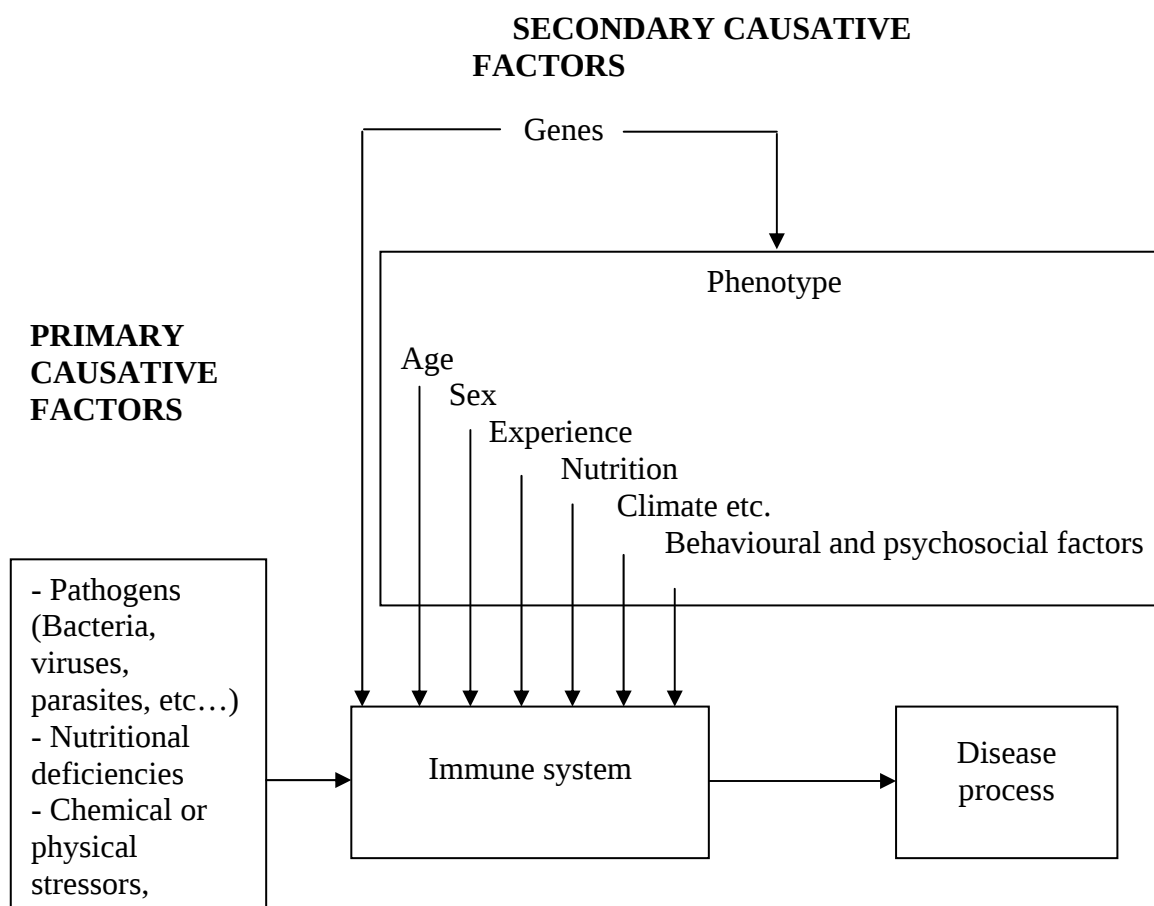


Fig 1. Relationship between primary and secondary causative factors in disease
(Source: Adams, 1995)

The spectrum of infectious disease of sheep and goats in Vietnam

There is a wide range of causative agents in Vietnam and preventive health care facilities for small ruminants are inadequate. Consequently, infectious diseases constitute a major constraint to sheep and goat production in Vietnam. However, it is not within the scope of this paper to review each disease separately. For detailed discussion on each disease in goats and sheep, the reader is referred to the relevant reviews (Barlow, 1982; Beveridge, 1983; Henderson, 1990)

The following table (Table 1) lists the major diseases that have been considered significant in goats and sheep in Vietnam.

Table 1. Summary of some infectious diseases known to affect sheep and goats production in Vietnam (Nguyen et al., 1994; Pham, 1997; Ha et al., 2003)

Diseases	Causative agents
Footrot (?)	Bacteroides nodosus and Fusobacterium necrophorum
Foot abscess (?)	Actinomyces/Corynebacterium pyogenes
Pasteurellosis	Pasteurela multocida and Pasteurella haemolytica
Enterotoxaemia	Clostridium perfringens type D
Salmonellosis	Salmonella sp.
John's disease	Mycobacterium paratuberculosis
Mastitis	Bacterial species (Staphylococcus, Streptococcus, Bacillus...)
Helminthiasis	Nematodes (Moniezia expansa), Cestodes (Fasciola gigantica, Paraphistomum cervi), Trematodes (Haemonchus contotus, Trichostrongylus sp., Oesophagostomum sp., Bunostomum sp., Trichocephalus sp.)
Coccidiosis	Eimeria spp.

Given that a number of bacterial and viral diseases may occur in sheep and goats in Vietnam, diseases caused by parasites, including helminthiasis and coccidiosis have been considered to be the most important constraint to sheep and goat production in South East Asia in general and in Vietnam in particular (Pandey, 1995).

Control and prevention of diseases

Control and prevention of infectious diseases in sheep and goats should be aimed at reduction of pathogenic agents in the environment through non-immune prevention measures and provision of an adequate level of immunity in animals primarily through vaccination. Good management (sanitation, farrowing crate design, ventilation, temperature, feeding regime, and season) certainly has a great influence on the susceptibility of animals to infection (Franz and Nguyen, 1997). This is also the conventional and the cheapest approach for prevention of diseases. However, some infectious agents cannot be eliminated completely from a herd whatever the measures are taken. Thus, appropriate management together with strategic use of vaccines and drugs will decrease animal losses.

In fact, vaccines are available for only few of the many infectious diseases of small ruminants. For examples, only Pasteurellosis and Enterotoxaemia vaccines are present in Vietnam at the moment for prevention of bacterial diseases in sheep and goats. In addition, the lack of effectiveness of some vaccines and the developments of resistance of pathogens to drugs and chemicals are becoming increasingly common (Nicholas, 1987). Disease control programs of selective breeding for resistance, therefore, are considered firstly being justified economically and secondly, due to the lack of alternative control systems including effective vaccination programs or eradication programs (Raadsma, 1995). Furthermore, resistance to drugs and demand for lower levels of chemical residues in livestock products and in the environment, has stimulated disease control methods which are less reliant on chemotherapy, such as the use of breeds or genotypes that are resistant or tolerant to disease and do not require expensive chemotherapy. Breeding for resistance will leave a proportion of animals affected and exposed to disease agents over a longer time. The application of breeding for resistance to infectious diseases, however, should consider several aspects, including: the impact on production, cost of control, alternative long-term strategies and zoonotic potential.

Research on breeding for disease resistance in sheep and goats, however, is still very limited in most Asian country. Disease resistance has not yet been included in breeding programs and very few reports on disease resistance in small ruminants in South East Asia exist. In Vietnam, no efforts have been made so far to breed small ruminants for resistance to infectious diseases.

References

- Adams, D.B., 1995. Assessing the importance of infectious and non-infectious disease in small ruminants in Australia. Breeding for resistance to infectious diseases in small ruminants. G.D. Gray, R.R. Woolaston and B.T. Eaton, ACIAR: 309-322.
- Barlow, R.M., 1982. Infectious diseases of sheep and goats. Sheep and goat production, I. E. Coop: 151-174.
- Beveridge, W.I.B., 1983. Bacterial diseases of cattle sheep and goats. Animal Health in Australia. Canberra. I: 196.
- Do, T.T.V., T.M. Nguyen, 2003. Cassava as small ruminant feed in the hilly and mountainous area of Bavi district in North Vietnam.
- Franz, K. and Q.S. Nguyen, 1997. Important diseases of the goat, Goat and Rabbit Research Center.
- Ha, T.H. and D.D. Vu, 2003. "Observations on parasitism of goats raised in Bavi district." Veterinary Sciences and Techniques X (1): 36-41.
- Henderson, D.C., 1990. The veterinary handbook for sheep farmers. Ipswich, U. K., Farming Press Books.
- Khuc, T.H. and T.M. Nguyen, 2003. Study in processing and utilizing rice straw as a feed resource for sheep in North Vietnam, Sida-SAREC. 2005.
- Nguyen, T.H. and Q.S. Nguyen, 1994. Investigation results on infestation of helminths of digestive tract of goats. Veterinary Sciences and Techniques I (5): 64-69.
- Nicholas, F.W., 1987. Veterinary Genetics. Oxford, Clarendon Press.
- Pandey, V.S., 1995. Studies on genetic resistance to infectious diseases of small ruminants in Southeast Asia. Breeding for resistance to infectious diseases in small ruminants. G.D. Gray, R.R. Woolaston and B.T. Eaton, ACIAR: 173-178.
- Pham, S.H., 1997. Study on biological characteristics of *Pasteurella multocida* causing Pasteurellosis in goat in the North Vietnam and selection of strains for vaccine production. Institute of Agricultural Science and Techniques. Hanoi: 96.
- Raadsma, H.W., 1995. Genetic variation in resistance to bacteria. Breeding for resistance to infectious diseases in small ruminants. G. D. Gray, R. R. Woolaston and B. T. Eaton, ACIAR: 15-42.
- Vietnam, T.W.B. I., 2002. Vietnam Development Report.