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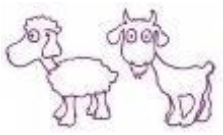
Sheep or goat: can you tell the difference?

Did you know that in regard to many diseases, it has been considered for some time that goats are similar to sheep, and that results acquired from sheep were applicable to goats? For instance, for many years, the registration of anthelmintic drugs (drugs that expel parasitic worms – helminths – from the body) did not discriminate between the two hosts. Drugs that were registered for sheep could automatically be prescribed to goats.



Goats: what are they good for?

Goat production is an example of a sustainable production that is fully integrated within the local rural development. Goat farming, including the farming of traditional, local breeds, plays a key environmental role that includes the natural upkeep of less fertile areas and the preservation of environmentally fragile ecosystems: natural spaces of the pastureland type have been preserved for centuries thanks to just such farming.

In 2007, the world goat population was estimated at 831 million animals compared to a sheep population of 1,09 billion. The goat population is expanding more rapidly because of goats' economic value as efficient converters of low-quality forages into quality products, and also due to farmers' determination to be self-sufficient where resources are limited.

More than 90 % of goats are found in Asia and Africa. The notorious description of goat as 'the cow of the poor' underlines its importance in small farming systems. Goat production, even if it is still considered of small political impact at European level, remains important in countries like Greece, Bulgaria, Spain, France, Italy and Romania. Apart from these traditional Mediterranean and Balkan areas, a non-negligible number of goat flocks is spread all over Europe, generating considerable returns for the farmers.

The current success of goats seems to be related to two characteristics: they are a source of high quality protein (as is the case for milk and meat in developing countries); and they produce commodities for valuable niche markets in developed countries (labelled and/or organic high quality dairy products suitable for special diets).

...and they must come with parasites!

One of the main threats to the outdoor breeding of goats is parasitism. For years, it has been considered that the data obtained on parasite infections in sheep could be directly transferred to goats. Unlike in cattle, the same species of parasites such as cestodes, trematodes and nematodes infect the two small ruminant species. However, some data suggest the existence of different caprine and ovine strains for some nematode species. Because of their ubiquitous distribution and high prevalence, infections with parasites have a major economic impact on goat farming. In developed countries, the main consequence is a severe loss of production.

Despite the similar number of goats and sheep in the world, and the similar consequences of parasitism in both species, the majority of studies on host-parasite interactions and/or their control, have been carried out on sheep. By comparing references on gastrointestinal nematodes in both goats and sheep, two databases show that only 20 % to 25 % of references relate to caprine studies. The relative dominance of sheep production in developed countries might explain such an imbalance.

Goat Parasite Interactions: from knowledge to control

Recent multi-disciplinary studies have highlighted the existence of significant specificities in the goat-parasite interactions, hence the need for direct caprine studies.

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Related Links

- CAPARA Website
- COST Action FA0805

The generation of comparative data in goats and sheep will help better understand some basic differences in the regulatory mechanisms controlling parasitic infections and explore some trade-offs between these regulatory processes related to either the host's behaviour or to the host's immune response. These studies will also allow for an adaptation in the measures of control, so that these main differences and their consequences can be taken into account.

Comparing results on the interactions between parasites and sheep and those same parasites with goats demonstrates how inferring data acquired on one host species to a second one can lead to errors that might have dramatic consequences on the control of these infections. It also illustrates different potential approaches for control: if exploiting the immune response combined with strategic treatments seems an efficient option in sheep, exploiting the feeding behaviour, including the potential to self-medicate on natural resources, might be as valuable in goats.

Collected data also illustrates the urgent need for holistic approaches and how any analysis of the host-parasite relationships should integrate environmental factors (e.g. whether or not goats have the ability to graze). Research on specificities of goats to parasitism is an interdisciplinary subject which must integrate data from various research fields. Although some European teams working on parasitism in goats are internationally established, overall research across various European countries remains dispersed and diluted.

There are questions waiting for an answer that will have an impact on farmers and veterinary practitioners, pharmaceutical companies, consumers' national and international regulatory authorities and international goat associations.

A current trend to promote more caprine studies on host-nematode interactions has recently emerged, as it is shown by data produced by the US Southern Consortium for Small Ruminant Parasite Control. Europe's answer to this trend is the recently launched European COST Action FA0805 'CAPARA' (Goat-parasite Interactions: from knowledge to control).

Since its launch in early 2009, CAPARA has already been successful in setting up a **multidisciplinary network to provide scientific grounds, to increase knowledge on specificities and to develop customised strategies to control parasitism in goats in order to improve sustainable goat rearing**.

CAPARA has created a core group which links scientists either:

- Within Europe: from southern to northern countries by a transfer of knowledge from the traditionally experienced scientists to the 'newcomers' or
- Outside Europe: including countries such as Israel and Turkey, where goats have always played a major role, as well as Australia and New Zealand with their vast expertise on sheep diseases/ and management.

The research groups within CAPARA are working on this topic to deliver, firstly, an effective, integrated management scheme for safe and cost-effective control of parasites in goats and, secondly, rules to harmonise drug administration in goats according to EU legislation.