The gaps and environmental challenges for small ruminant production in Turkey

Yildirir M.

in

Ruiz R. (ed.), López-Francos A. (ed.), López Marco L. (ed.).
Innovation for sustainability in sheep and goats

The gaps and environmental challenges for small ruminant production in Turkey

M. Yildirir

Department of Livestock and Aquaculture Research, General Directorate of Agricultural Research
and Policy (GDAR), Yenimahalle-Ankara, Turkey

Abstract. Livestock production aims to sustainability, increasing productivity and producer incomes. In Turkey, largest population of sheep and goat known by adaptation to marginal conditions with low reproductive efficiency, and low milk and wool production In extensive livestock production systems the productivity of meat and milk producing animals is low compared with that of the intensive production systems. There are three general production systems, the sedentary, transhumant and nomadic system. While the nomadic system decline the sedentary system increase and transhumance is still common. Improved genetics is effective in commercial systems, however in marginal environments and extensive livestock systems have interaction effects of the adaptation, production environment and management practices should account for sustainable farming. Breeders prefer cross-breeding and changing their breeds with improved bred to increase productivity (i.e., live weight, milk yield and reproduction). Locally adapted breeds known having lower reproduction, meat and milk production levels' compared to the exotic breeds and their crossbreds. But, integrated approach should be placed on via developed breeding programs. Breed adaptation, conformity with production environment and marketing opportunity are important points for the sustainable production; therefore interrelated effects must determine and take into consideration in the long-term goals. Good management practices, high exploit production environments, and better product quality for marketing which may answer consumer preferences.

Keywords. Sheep – Goat – Adaptation – Production environment – Productivity – Sustainable production.

I – Defining production systems

The management practices and production systems developed by adaptation to the production environment since the domestication. Therefore, livestock production systems differ widely in relation to production environment, species/breeds, degree of intensification, use of resources, local condition, socio-economic condition, cultural/traditional/religion aspects etc. Thus, determination of the production characteristics of the breeds and identification of important features in certain production environment are fundamental steps.

With the arid/semi-arid climate Turkey has large grasslands and steppes that are suitable for sheep and goat breeding. Anatolia's rich geographical and climatic conditions cause high genetic diversity of animal genetic resources (AnGR). In 2017, Turkey has 30.9 million head sheep (47 breeds) and 10.3 million head goat with (18 breeds). The number of purebreds declined and even their populations reached to the threshold of extinction mainly due to the uncontrolled crossbreeding. Therefore, efforts related to the conservation of AnGR have been increased in last two decades. Subsidy policy has been continuing since 2005 for the AnGR which are under the risk of extinction. National Strategy and Action Plan for AnGR Turkey (2015-2010) accepted as priority of developing strategies to sustainable production of AnGR, i.e. breed specific products, niche markets, traditional production systems and long term breed improvement programs via breeder organizations.

For the prior classification, livestock productions have been characterized as extensive, semi-extensive and intensive. A key factor of intensity is input of purchased feedstuffs together with information regarding stocking rate or grazing duration (Gelasakis *et al.*, 2017). Typically, small rumi-

nant systems comprise of small-size flocks that are managed with family labor. Most of the farms are operated as family based enterprises. Herding mostly carried out by household member. Some farms paid their workers as employees (shepherd, management etc.). In accordance with the dependency of natural resources, production systems can classified as land based and landless systems. Commercial-industrialized enterprises can classified as non-family farms. Landless commercial production systems are mainly present in west part of Turkey. And, they characterize using high productive breeds such as Saanen and Shami goat.

For the small ruminant breeding there are three general systems; the sedentary, transhumant and nomadic system (Yalçın B.C., 1986). The nomadic system is dramatically declining. Transhumance is still common but is leaving its place to sedentary system for sheep and goat production because of the social and economic condition (Gürsoy, 2005). Farmers prefer to stay settled and enjoy common development and follow the changing socio economic conditions.

II – Sustainable production

Livestock production aims to sustainability, increasing productivity and producer incomes. Sustainability of sheep and goat breeding concerns about the relationship among production environment (e.g. climate change, soil formation, water cycling, regulation services), social context (increasing demand for livestock product, religion,) and mainly economic dimensions.

The factors that contributed negatively to the small ruminant production in Turkey are many; low genetic potential of the native breeds, inappropriate breeding strategies, decrease in the area covered by pastures, intensification of agriculture and livestock production, demand for high status jobs, support regimes favoring poultry and dairy production, inappropriate market conditions for sheep and goat production. The livestock inventory data show that the number of the animals has decreased since the early 1980s and the number of breeds at risk in Turkey (Yıldırır *et al.*, 2011). For this reason, the conservation and sustainability of farm animal genetic diversity in Turkey is essential for sustainable animal production, rural development and food security.

Traditional small ruminant production is characterized by low inputs and low outputs. The low input–output production system in the sheep and goat production is not satisfied developing economical and social welfare conditions in the rural areas. Because of the complex and diverse nature of the traditional livestock keeping socio-economic factors are more important in order to fully explain the determiners of the production. Do the pastoral livestock breeders always face to low potential and use the unfavorable agricultural areas?

The proportion of household income from livestock sources differentiated in different based livestock production system. Therefore, one way analyze does not fully explains the real production determiners, because of the complex and diverse nature of the traditional livestock keeping. The classification of native AnGR in their original production environment with socio-economic characteristics can also help to market traditional and qualitative products. In Turkey, largest population of sheep and goat known by adaptation to marginal conditions with low reproductive efficiency, and low milk and wool production. Despite a low in milk, reproduction and meat gross output per head fell breeders preferred to continue production because of the socio-cultural factors and livelihoods.

Locally adapted breeds known having lower reproduction, meat and milk production levels' compared to the exotic breeds and their crossbreds Improved breeds and crossbreeds can increase productivity (i.e., live weight, milk yield and reproduction). However, exotic breeds more vulnerable than local breed for the new production environment. An integrated approach should be placed on via developed breeding programs, good management practices and high exploit production environments.

Local species and breeds often have advantages in terms of their ability for adaptive traits, but also disadvantages for productive traits (Anderson, 2003). Studies are required to quantify most of these valuable characteristics and to identify the underlying genetic effects.

In extensive condition the total milk yield per lactating was estimated to be around 50-100 kg for sheep and goats. According to field observations, some breeders prefer low production level for the some of the native breeds. Low production levels could be preferable under the certain circumstances especially for adaptive traits. For example Honamlı goats, knowing high performance, some breeders stated that they intentionally select lower milking performance of goats for the adaptation to the particular marginal production environments and feeding conditions. Thus, the adaptation level should be considered when recommended to certain environment.

Contrarily, indiscriminate cross-breeding reported as top threats for the AnGR in the SoW-AnGR (FAO, 2015). Many farmers prefer cross-breeding their local breeds with exotic breeds to take advantage of the combination of adaptive and productive traits.

On the other hand, some indigenous and locally adapted breeds lost their economic importance and thus becoming endangered. Under the conditions, there is no other choice for these farmers whether cross-breeding or to get support from conservation subsidy. For the conservation of breeds that are threatened of extinction, which factors can be used as an incentive for farmers to sustainable production?

Having breeders associations and coordinate production activities (e.g. provide input, market linkage, genetic selection, performance recording, sire exchange schemes) are crucial especially for the local breed farmers. Breeders associations for sheep and goat are new and the formation need to be progress for the operational real affects in Turkey. Developed countries have successfully used rural development tools. The stakeholders such as breeder organization, cooperatives, university, NGO has taken responsibilities for the sustainable production and rural development.

Marketing services was the most important service among the breeding program activities in priority order for goat keepers (Bett *et al*., 2009). This classification can also help to farmers depending on differences between their socio-economic characteristics. For example, encouraging traditional goat farmers to manufacture protected designation of origin (PGO) dairy products from their own milk may make their farms more viable (Gelasakis *et al*., 2017).

Social and cultural factors have profound effects on sustainability of livestock production systems in particular locations. However, small ruminant productions are probably not well understood. Because of the complex situation of the environment, cultural, social and economic factors, it is often unclear how these factors play out in relation to impacts on livestock breed and production systems. But this conditions changes thanks to projects that focus AnGR.

III – Conclusion

In order to maintain food safety and agricultural production, AnGR and production environments are two basic components of biological diversity. In terms of sustainability, functions of the both component should be well analyzed. Breed adaptation, conformity with production environment and marketing opportunity take into consideration in the long-term goals. Good management practices, high exploit production environments, and better product quality for marketing which may answer consumer preferences.

References

Anderson S., 2003. *Animal genetic resources and sustainable livelihoods.* Ecological Economics. 45: 331-339.

Anonymus, 2015. *National Strategy and Action Plan for Animal Genetic Resources of Turkey*. Ankara, Turkey.

Bett R.C., Kosgey I.S., Kahi A.K. and Peters K.J., 2009. Realities in breed improvement programmes for dairy goats in East and Central Africa, *Small Ruminant Research,* 85, p. 157-160.

Gelasakis A.I., Rosea G., Giannakou R., Valergakis G.E. Theodoridis A., Fortomaris P. and Arsenos G., 2017. Typology and characteristics of dairy goat production systems in Greece, *Livestock Science,* 197, p. 22-29.

Gürsoy O., 2006. Economics and profitability of sheep and goat production in Turkey under new support regimes and market conditions, *Small Ruminant Research,* 62, p. 181-191.

Yalçın BC., 1986. Sheep and Goats in Turkey, *FAO Animal Production and Health,* Paper. 60, 97 p.

Yıldırır M., Sezenler T., Erdoğan İ., Yüksel MA, Soysal D. and Ceyhan A., 2011. The Present Studies on Animal Genetic Resources in Bandırma Sheep Research Station: a Review, *J. Anim. Sci. Adv.*, 1(2), p. 73-78.