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## Animal Agriculture **Animal Husbandry Practices in Nepalese Goat Herds**

Nepal is a country in Asia that is most famous for their connection to Mount Everest. Landlocked by two larger nations, China and India, Nepal is mostly an agrarian country in spite of it being home to eight of the world's 14 largest mountains (Sharma, 2020). Because of its proximity to the mountains, Nepal primarily raises small ruminant animals including goats (Ghimire, 2019). These animals are preferred because of their ability to graze on land not suited for cattle and because they do not have any religious connotations attached to them when it comes to slaughter and harvest (Ghimire, 2019). Goats are primarily used for meat, but their milk can also be collected for consumption. Their fiber is used for making fabric and their manure breaks down in the soil and is used as organic fertilizer.

The people of Nepal primarily live in houses made up of both mud and concrete. Very few families have running water and working toilets, but almost all use electricity for lighting. The average Nepalese family has four people and stick to strong gender roles. Even though these roles vary depending on the family's religion, social class and more, an immense amount agree with respecting elders and that men have predominance over females. Traditionally women do the housework and do not make big decisions for their family, while men are known to provide, financially, and protect their household (11).

The population of Nepal is inherently rural with 65.6% of the population engaging in agriculture and money earned from its pursuits reaching 35% of their gross domestic product (J. Inst, 2019). Livestock makes up 14% of this gross domestic product and plays a big role in the lives of Nepalese farmers (J. Inst, 2019). Most of these farmers rely on goats as their primary source of revenue, especially in the hills where it is difficult to raise other animals. In the area known as the hills, goats make up 49.66% of all ruminants and are a significant contribution to farmer's livelihoods in these places where traditional farming cannot occur (J. Inst, 2019).

Another reason why goats are so popular is because they are easily tended by women. Many of the men in Nepal seek employment in other areas and because of this, it is up to the women to stay home and raise the livestock (J. Inst, 2019). One advantage to having goats is their small size. It is easy for women to handle these animals and the fences and pens used to contain them are much smaller than traditional cattle fences. Goats also provide a unique blend of fiber in their hair. Most goats have a cashmere under coat, which can be harvested either by shaving the goat or once the goat has been slaughtered. This cashmere under coat is highly desirable in the textile industry and can provide additional income for families.

Goat production in Nepal is on the rise, a trend that appears as though it will continue. An article from 2017 found in the Journal of the Institute of Agricultural and Animal Sciences, says 2.79 million of the 5.6 million people in the country raise goats (J. Inst, 2019). Even though this number seems relatively high, families only average between three and four head in their herds (J. Inst, 2019). Because the herd

sizes are so small, the demand for goat products is outpacing the ability to provide them and farmers have little left over from their goats after they have provided for their own families needs.

One thing that contributes to the need for larger scale goat production in Nepal is the amount of meat they import from other countries, especially India. All of the caste systems but one in the country will eat goat meat over other sources of protein and when it is festival season, the country imports over 50,000 head just to meet the demands of the season (Bc, 2019). On average, Nepal is spending more than \$40 million U.S. dollars on goat meat, a demand that is not thought to diminish anytime soon (J. Inst, 2019).

This huge importation of goats into Nepal is a big problem because it means money is changing hands across the border instead of increasing economic growth within the country's borders. Some farmers in Nepal recognize that this is happening and they are looking for ways to combat it by carefully saving to purchase new genetics, which can be introduced into their goat herds.

Raising only a small number of animals on a farm means it is sometimes difficult to introduce new genetics into the herd. The government has not been helping in this matter as breed improvement programs have been under review, in some cases for the past 50 years, with no decisions being made (Humanitarian, 2013). Because of this, many farmers are using the same breeding and animal husbandry practices they have always used, resulting in low quality stock that does not produce much in terms of meat or milk (Humanitarian, 2013). This is one of the greatest challenges that small livestock farmers face within their operations.

To combat this challenge, it is important to look at the breeds of goats that would provide them with hearty stock and would produce a high return in terms of product. For meat production, the most obvious choice for goats would be the African Boer goat, a heavy muscled breed that gains quickly. Owners of African Boer goats in Gippsland, Australia have started a program in Nepal that aims at bringing these new goats to the mountains where they can be crossed with the stock already there (Hörchner, 2020). So far this program seems to be working. The goats are flown in from Australia on a passenger aircraft and then delivered to newly established breeding centers (Hörchner, 2020). There the goats are crossed with those already in the country and as a result, the Nepalese are seeing a growth in production with body weights increasing from 30 kilos in 18 months to 30 kilos in six months (Hörchner, 2020). African Boer goats are also good mothers and produce plenty of milk to feed their offspring.

Another key piece in bringing in outside genetics for farmers is work with organizations such as Heifer International. Heifer International operates on donations from people around the globe who want to make a positive difference in the lives of others. The premise behind this program is that it provides farmers not with money, but with livestock like a goat that they can use to supplement either their families income or their families nutritional levels, sometimes both. Unlike the African Boer goats being brought in for their meat, most of the goats provided by Heifer International are dairy goats that provide families with milk, which can be turned into butter and cheese (International, 2020). These items are easily sold to give extra income to the families and the introduction of new goats into the area provides valuable mating

opportunities outside of the farmer's original herd.

Once farmers have established a solid plan to increase genetic potential in their herds, the next step is to take a look at the animal husbandry practices they are currently using including their disease prevention methods. A study put out by Feed the Future notes that one of the biggest disease problems facing Nepal is sheep and goat pox (Sigdel, 2016). Sheep and goat pox mostly affects young kids rather than full grown adult goats (Sigdel, 2016). It is also known to cause a diminished quality of products, especially coat quality, which is often clipped and used to make clothing or blankets (Sigdel, 2016). This disease is mostly transmitted through lesions in the skin or by close contact of "aerosol...secretions" (Kardjadj, 1970).

Preventing diseases like goat pox can be a challenge for farmers. One way to prevent its spread is by providing goats with routine vaccinations. The long acting live vaccines typically last up to two years, while the inactive vaccines protect for a shorter amount of time (Kardjadj, 1970). Unfortunately, many farmers in Nepal do not have access to these vaccines or clean supplies to administer them.

That leaves the second option, which is to quarantine the sick animals away from others in the herd (Kardjadj, 1970). For some farmers this is also difficult because they have relatively small areas in which to house their goats and they are unable to access supplies that allow them to put up additional fences or buildings. Goats who have been infected should be culled from the herd and those that die from the disease need to be burned or buried away from the property (Kardjadj, 1970). These also pose challenges for farmers who may not have extra space to bury an animal that would not contaminate other landscapes and culling is difficult when that animal may represent your family's only source of additional income.

In order to overcome some of these challenges, farmers need to get creative about how they manage disease in their herds including the biosecurity measures they introduce to keep sheep and goat pox from spreading. A biosecurity measure that farmers can introduce into their herds is personal hygiene. It is important that anyone who comes into contact with the goats on the farm wash their hands after handling these animals. This will prevent any traces of the virus that may be on the animal's skin in the form of lesions from spreading. Along with hand washing, farmers should consider washing their clothing and shoes or boots after contact, especially if an outbreak has occurred on the farm.

When an outbreak has occurred on a farm, farmers must take extra care in tending to the infected animals and the areas in which they live. An article in *Tropical Animal Health and Production* says, "the virus is killed by sunlight, but can persist for up to 3 months in scabs and hair, and up to 6 months in shaded animal accommodation" (Sigdel, 2016). Inside of sheds is particularly vulnerable to the virus laying dormant and it is important that these areas be completely freed of waste and used bedding. The area must then be scrubbed down as much as possible with soap and hot water and allowed to be unoccupied until a period of six months has passed. After this time, farmers should replace any bedding and may reintroduce goats to the area. Any animal that survives an outbreak should be quarantined away from the rest of the herd for at least 45 days before they are reintroduced (Spickler, 2017).

For farmers living in Nepal, education is a key factor in increasing the production of their goat herds. They must first recognize that the practices they have employed in the past may not be the most successful moving forward, especially if they want to increase production from their animals. Once they understand that better methods exist, it is up to them to decide how they want to use this knowledge in their own herds. Keeping their animals healthy must also become a priority and again stems from education about best practices. Biosecurity in livestock production is not new, but increased awareness has changed the protocol followed by producers here in the United States and across the globe. It is important that farmers living in Nepal are made aware of these changes and recognize that small shifts can make a big impact in herd health. Even simple methods like washing your hands after working with animals or cleaning your shoes can limit the spread of diseases like sheep and goat pox.

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