Lessons Learned in the Peruvian Highlands

by Stephen R. Purdy, DVM

Background

My observations are based upon 1.5 years of short visits at two farms in the southern Peruvian highlands in Nunoa district. One farm has approximately 1000 alpacas (Suris and Huacayas) and the other has approximately 600 animals of both breeds. The larger farm is operated by one manager and 3 farm families who live with the herd. The farm also raises Brown Swiss cattle, llamas, and sheep. A few horses are used for transportation in the mountain pastures which are at 14,000 to 15,000 ft altitude. The smaller farm consists of 20 families with a community herd and also individual small herds of alpacas. Some families have llamas, donkeys, and horses. These families also have a community plot for potatoes and quinoa farming. They are at approximately 13,000 ft altitude. The weather ranges from 25 to 65 °F each day year round with the cooler temperatures coming in May through October during the dry season. Birthing and breeding occurs during November to March during rainy season to take advantage of the best pasture for late pregnancy, lactation, and early cria growth. Animals are kept in high pastures during rainy season when it is too wet at lower elevations and in lower pastures during the dry season. Shearing is done by hand clippers from October through December. The price of wool is very low currently at approximately $2 per pound for raw clip of blanket fleece. Alpaca wool is the primary agricultural product in this area of Peru.

Farm A: 1000 alpacas at 14,000 to 15,000 ft.

Housing- All animals are on pasture only with no hay or grain feeding. Water comes from streams and springs. Animals are corralled at night for predator control and also to allow the manure to be collected for use as fuel and fertilizer. All species cohabitate on the farm. The herd is split into groups based upon sex and age. These groups include: breeding females and crias, breeding males, non breeding males for wool and meat, and tuis (males and females between 1 and two years of age who are too young to breed.

Alpaca breeding plan- All animals are pasture bred for 3 months during the rainy season. 10 males are used to breed 350 females. They are exposed to the females for 4 days at a time with 15 days rest in between. Another male is introduced after each one leaves to rest. Colors are bred to each other to maintain color variation. Females are started breeding at two years of age if they have good fleece and body condition. If not they are not bred and have inferior fleece they are used for meat. Females have three seasons to get pregnant and deliver a cria. If this does not happen they are removed from the breeding program for wool or meat production. Records are kept and all animals have ear tags so that production can be evaluated. Herdsmen track pregnancy success of males by observing behavior of females during the breeding season. Males or females which produce crias with congenital defects are immediately removed from future breeding.

Breeding success of females- Ultrasound examination of 186 females in August 2009 revealed a 71% pregnancy rate at 4+ months of pregnancy. Of these 186 animals, 8 (4.3%) were noted to abort in the next 2 to 3 months. Ultrasound exams of 330 females in August 2010 revealed a pregnancy rate of 79% in younger females and 90% in the older females. Clearly careful selection of males and continued monitoring of birthing

success is critical to this success rate. It is much higher than the 40 to 50% birthing rate reported in other areas of Peru. Males are selected on the basis of superior fiber and then the best are started into breeding. The herd is evaluated each year and replacement breeding males and females are selected from within or new genetics are introduced by purchasing superior animals from other top farms in the area.

Breeding male evaluations- In January of 2010 and 2011 fourteen different, actively breeding males had semen analyses performed by collecting a post breeding sample from the vagina with a speculum. Initial determinations of sperm activity and estimated concentration (high, medium, and low) were made on the farm at environmental temperatures of approximately 40°F (no electricity available). Semen smears were made using Eosin-Nigrosin stain for later evaluation of live/dead percentage and sperm morphology. If enough semen was available from the post breeding collection, actual concentration was determined using a counting chamber and Unopettes. The variation of parameters measured was comparable to those measured in the US for alpacas in the New England states. Sperm activity ranged between 20 and 80%, sperm concentration ranged between 10 and 200 x 106 sperm per ml, percent live sperm ranged between 60 and 80%, and percent normal sperm ranged between 60 and 80%. There was a similar distribution among morphology as is seen in the US for proximal and distal cytoplasmic droplets, midpiece abnormalities, tail abnormalities, and the lower percentage findings of microcephaly, twin heads, decapitated heads, headless tails, and tailless heads. In January of 2010 twenty breeding males were evaluated for testicular size using both calipers and ultrasound. These two methods revealed comparable results as has been seen in many other places. Calipers are an easier and quicker method of measurement especially in direct sunlight at high altitude. Most males had similar sized testes to breeding males in the New England states with the length approximately 3.8 to 4.5 cm and thickness approximately 2.3 to 2.7 cm.

Intestinal parasite control- At the start of my association with this farm they were spending approximately $400 per year to inject every animal on the property with 1% ivermectin once per year. I convinced them not to do this any more after running fecal tests on all groups in August 2010 and January 2011. We found very few parasites in the animals which were predominantly at body score 3 of 5 over the last 1.5 years. None of the adult animals tested exhibited diarrhea at any time. The same parasites were found as in the US: small coccidia, Eimeria macusaniensis, Nematodirus, strongyles, and tapeworms. As in the US the younger animals (crias and tuis) showed most of the parasites but none had high EPG or OPG counts.

Skin parasites- The primary skin parasite seen in southern Peru is sarcoptic mange as opposed to the chorioptic mange seen in US alpaca herds. In the past animals were successfully treated for mange with one injection of 1% ivermectin but this is no longer effective, just as in the US. After observing a Peruvian parasitologist's treatment trials a few years ago I have adopted topical treatment with petrolatum in the US to treat chorioptic mange. It has worked well for me and since instigating its use at this farm in Nunoa for treatment of sarcoptic mange, the farmers are very satisfied with the results. I noted in August 2010 that 18/82 (22%) older females in one group showed signs of mange while only 8/95 (8.4%) of the tui females in another group had mange. This is still a relatively high infection rate compared to the US.

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Cria deaths- Cria mortality at this farm is associated in the first few days and weeks of life primarily with pneumonia. This occurs when slow newborns are exposed to wet, cold conditions in the birthing season. We are in the process of locating and building cria tents to help avoid this loss. In some past years enterotoxemia has been associated with cria losses at 2 to 6 weeks of age of up to 30% mortality. Most of the enterotoxemia cases in Peru have been identified at San Marcos University in Lima by Dr. Raul Rosadio as being due to Clostridium perfringens, type A. The university produces a vaccine which has been effective for years against this disease. The farmers in Nunoa were not aware of it and also most do not have money to purchase it for inoculation of pregnant females and neonatal crias. Use of this vaccine in fall 2009 at this particular farm eliminated enterotoxemia deaths during the birthing season in late 2009 and early 2010. We have initiated an ongoing vaccine program there and are also petitioning the local government to provide the vaccine for all alpaca and llama farmers in the area. This is neither a simple nor a fast process.

Farm B: 600 alpacas at 13,000 ft.

First evaluation performed in January 2011- 60 alpacas of various ages and sexes were examined. Body scores were found to be 2 to 3 of 5. Poorer quality fleece was noted than that seen at Farm A. This community bred 280 females in 2009 and had 100 crias born in 2010. This is a very low 34% birthing rate. 10 of those crias died of pneumonia and another 6 died of enterotoxemia symptoms. The community leader had heard we were performing fecals on animals and he requested we sample some of this group. We sampled 20 tuis from the group and found only one strongyle egg from all of those fecals. It was our suspicion that poor genetics and poor breeding management was the problem on this farm, not intestinal parasites. The community uses 6 males to breed all 280 females. The rest of the breeding details were not available. This will be a continuing evaluation process to see what can be done. The manager of Farm A gave this farm one good male to use but they immediately sold it for the cash to buy food and seeds for planting. Clearly their poor genetics (including fiber) are resulting in severe economic hardship. Unfortunately this is commonplace in the region. Very few farms have the management plan and cash flow to show the success of Farm A.