

Nunoa Project Peruvian Veterinary Work July 2016

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- This report summarizes Nunoa Project's (NP) work with alpaca farmers in the Department of Puno and llama farmers in the Department of Cusco in July 2016.
- At the end of each section an evaluation of the work and suggestions for future work are presented.
- In addition to team leader Dr. Steve Purdy the veterinary team consisted of: Dr. Gerardo Diaz of Peru, preveterinary students Katie Flanagan (MA), Peter McGinn (MA), and Joe Wong (CA), and veterinary students Ali Bush (Colorado State University- from CT) and Amanda Cormier (University of Minnesota- from MA).
- Overall the work is progressing satisfactorily and there is great promise for continued improvement.

Alpacas- Puno- July 15- 20

The 5 community visits were made in a 4 WD pickup, or car as appropriate. Necessary equipment was then carried up to the individual farm sites. Animals were examined for pregnancy (those which were bred to Nunoa Project superior males and other males) and body condition score. Farmers also asked to have their personal breeding males evaluated. The results were discussed with each farmer along with a discussion of herd health problems and possible solutions. Future work in 2016 and beyond was also discussed.

1. Pucarayllu

Farmer	NP Macho	Original No. Females	No. Females Examined	Pregnancy Rate	Reported Cria Mortality Rate
A	2	36	35 (11 non program)	63% (64%)	?
B	1	28	27	78%	25%

Notes:

- Farmer A
 - 77% pregnancy rate December 2015 by palpation
 - 5 abortions- January, March, June, 2 in July
 - 1 cria born February so limited time to be rebred and dam was not pregnant
 - 1 animal from the elite breeding herd was eaten.
 - 1 mange case; 1 bad cria eye problem
- Farmer B
 - *Put in a new male when NP male was removed because NP male was "fighting with females"*
 - Suspect they were not receptive females but their numbers were not recorded by farmer to compare with pregnancy results
 - no way to tell the sire of crias born in March/April 2017
 - new male bred 2 or 3 females right away
 - ID of females was not recorded
 - They may have been problem breeders that were still not pregnant
 - 40 crias born in 2016- 25% died- cold given as the reason by the farmer
- Suggestions
 - *Record animals with problems for future discussion of causes and prevention*
 - *Tag crias and record number of dam to evaluate production*
 - *Use of cria shelters to prevent malnutrition and cold weather exposure deaths*

2. **Coarita**- Community Huacaya and Suri herds used 2 NP males each

Alpaca Type	NP Machos	Original No. Females	No. Females Examined	Pregnancy Rate	Reported Cria Mortality Rate
Huacayas	7 and 9	59	52	92%	12%
Suris	10 and 14	58	25	88%	?

Notes:

- Huacayas
 - 54/57 (95%) pregnant by palpation at selection December 2015
 - Some females lost ear tags- should have replacement tags ready; some were not caught
 - 1 female died due to dystocia
 - Breeding males are rested for 5 days every 5 days during breeding season
 - No mange and no eye problems
 - 7 adult and 10 cria fecals analyzed- mostly low levels of strongyles, *E. mac*, small coccidia, and *Nematodirus*, except for 1- 7 year old female with 1,200 OPG of small coccidia (normal feces)
 - 150 crias born
 - 7 died from cold
 - 11 died from diarrhea during rainy season; not sure what if any medication was used
 - 12% mortality rate
 - Community wants to use the same NP Huacaya males for 2016

- Suris
 - Only 25 of 58 females checked because *some farmers lived several hour's walk away*
 - Same male management as Huacayas
 - 5 adult and 2 cria fecals requested by manager- mostly low levels of strongyles, *E. mac*, small coccidia, and *Nematodirus*
 - Asked for new males with finer fleece- not available; may use same NP males or we will find new farmers to use them. *Fineness is not important with respect to sale price of wool as farmers are paid by the pound regardless of fiber characteristics.*
 - Internal parasite control recommendations
 - *There is not a significant problem with internal parasites so do not treat the entire herd or all crias at once, only those with clinical disease.*
 - Treat crias with diarrhea and not acting sick with anticoccidial medication.

3. **LaUnion**

Farmer	NP Macho	Original No. Females	No. Females Examined	Pregnancy Rate	Reported Cria Mortality rate
A	13	22	22	73%	48% in entire community
B	2 of owners adult and two young males have continuous exposure to females	Non program group #1 = 96	51	90%	"
C	Owner males with continuous exposure	Non program group #2 = approx. 50	12	92%	"

Notes:

- NPG #1- female to male ratio 48:1 and 90% pregnancy rate. This is excellent and represents high fertility in both females and males.
- 96 crias born in 2016: 44 died in rainy season and 2 died in July- 48% mortality- very high!

- 10/44 diagnosed with enterotoxemia by vet necropsy at 1-3 weeks of age
- The rest had similar clinical sign of sudden death without diarrhea = enterotoxemia also
- Corral used for crias was different from 2015
- Dams were all vaccinated with Enterotox; crias were to be done by farmer. *Suspect the exposure to the infectious organism was very high and/or crias were not vaccinated.*
- NP male group- 3 other males were in with the NP male for January- April (2 Huacayas and 1 Suri)
 - Not in accordance with NP male use contract they signed. Did add in some NP genetics but not sure how much since 3 other males were there. Program goals and features were re-emphasized with the farmers.
 - 22 females with 4 males and pregnancy rate only 73%- possible female problem or non-fertile/ low fertility males were breeding females
- *Community president wants NP to help give dewormer in December 2016. We told him we would run fecals and advise him based on results.*
- 2 eye problems- 1 punctured globe and 1 bilateral exuberant granulation tissue in central corneas of both eyes (2 year old problem)

4. Sapamccota

14 Nunoa Project machos- staying with Farmer A

- Macho NP 004 teeth are very short; he may have a problem eating although his BCS was 2 in July; Dr. Diaz will recheck him in mid-October and we will decide what to do.

Farmer	NP Macho	Original No. Females	No. Females Examined	Pregnancy Rate	Reported Cria Mortality Rate
A	6	33	26	62%	?
B	8	29	22	77%	17%
C	5	32	27	60%	?

Notes:

- Farmer A
 - 1 female died; others lost ear tags
 - BCS OK
 - 19 pregnant in December 2015; 7/19 did not get pregnant again with NP male
 - 3 not pregnant in December 2015 became pregnant with NP male; re-evaluate male after 2017 breeding season
- Farmer B
 - Approx. 30 crias born- 5 died in rainy season
 - 5 females missing- 2 died from alpaca fever according to necropsy results
 - 5 animals changed BCS from 3 to 1- all were found pregnant, but they do have a malnutrition problem
- Farmer C
 - 1 escaped on exam day; 4 lost ear tags
 - 26 crias died in rainy season in his herd- cause unknown
 - Pregnancy changes from Dec 2015 to July 2016
 - 5 yes to no
 - 1 no to yes
 - 4 not pregnant either time- (#186, 203, 216, 230)- stop breeding if not pregnant in 2017

5. Alto Pucarayllu

Farmer	NP Macho	Original No. Females	No. Females Examined	Pregnancy Rate	Reported Cria Mortality Rate
A	11	31	29	69%	?
Farmer Group B	4	27	15 (Choque animals not seen)	47%	?
Farmer C	39	21	0	NA	?

Notes:

- Farmer A
 - 1 female died and 1 could not be found
 - 5 were BCS 1 and 7 decreased BCS by 1 grade- malnutrition
 - 14 farmers in this community are interested in borrowing money to purchase machos to improve their herds
 - showed us the grant proposal that he presented to Chijnaya Foundation for funding;
 - *We offered to help them select the machos.*
- Farmer Group B
 - Only 15 animals presented for examination; 6/15 with BCS of 1- malnutrition
 - 5/6 of 1 farmer's animals pregnant
 - *They had the NP macho for only 1 month and then he was moved to another location for the remaining 2 months of the contract*
 - Not in accordance with the male use contract- reason not disclosed
 - This may account for the low pregnancy rate in this group; NP 004 is also the macho with the worn teeth
 - Also low BCS in the female group may be a cause.
 - Farmer C did not present animals for examination

General Suggestions for Alpaca Project:

- Progress is being made although not at the same rate in all communities or with all farmers. This is expected.
- We should continue to emphasize goals and advantages of a **controlled breeding program** to all participating farmers.
 - Some farmers seem not to understand the reasoning for keeping males and females in controlled groups.
 - They may not be able to be helped in the short term but we should keep trying if they are interested.
 - Hopefully when farmers see the crias from NP machos they will see the success of the controlled breeding program.
- We will need more tags for program females in December. We will leave tags with community technicians so they can replace ones which are lost.
- Continue to emphasize the use of **record keeping** in improving production.
- Tag crias born to program females so they can be critically evaluated for conformation and fleece in July 2017.
- **Technicians** were not involved in our July work except in Coarita and Sapamccota.
 - They knew when we would be there but supposedly the festival prevented them from being there. We should continue to emphasize the importance of interaction for the future of the community's production..
- We have to continue to try to **get community members involved** with the work we do. They seem reluctant to be involved with it at times.
 - It is important that we continue to explain the work to them before we start and the results after we are done.
 - We also need to continue to ask for their input regarding problems they have.
 - This is all part of the trust we need to continue to cultivate with the communities.
- To continue the **vaccine project for Enterotoxemia**, Dr. Gerardo Diaz travel to Pucara in Mid October 2016 to get it started.

- He will be in touch with the communities in advance of his visit and arrange for them to be able to procure any vaccine which may be needed for them to use.
- **The NP veterinary team will visit the 5 communities in early December 2016.**
 - New breeding improvement program females to be bred to NP males will be identified and tagged at that time.
 - Pregnancy exams will be completed on all program females.
 - We will also evaluate body condition in community herds and breeding males being used by communities.
 - We will distribute the NP machos for use in the communities.
 - As in past visits we will respond to farmers' concerns regarding their animals' health.
- Cold weather continues to have severe consequences for cria mortality and body condition score of all animals.
 - **Portable shelters** used for them when there is snow or heavy rains in cold temperatures should lower mortality rates
 - Some communities will be using these in 2017.
- Some farmers understand the value of **bringing in new genetics** to their herds to improve production of fiber and improve pregnancy rates
 - Farmers want to borrow money from Chijnaya Foundation to purchase new breeding males
 - NP would help them to select the animals

Llamas- Cusco- July 13- 14 and 22-23

This work involved presenting training seminars and visiting farmers in association with a project in Urubamba called **Llama Pack Project** (www.llamapackproject.com). Some herds were very remote and equipment was carried up to the herd sites. These were the first contacts with Macao and Quishuarani farmers along with the Llama Pack Project staff. They are just getting started with their project to improve llama health and to use llamas as pack animals in the Sacred Valley near Cusco. Our role is to evaluate their animals for body condition score, fertility, and suitability for packing, and to determine what their health problems are to explore possible solutions.

Farmer	No. Machos	No. Cryptorchids*	No. Geldings	No. Hembras	No. Crias	Total No. In Herd	Pregnancy Rate
A (Urubamba)	3	1 (left)	2	9	0	14	67%
B (Urubamba)	2	0	16	20 (not seen)	2	40	7-8 /20 per year
Farmer C (Maucau)	10	1 (right)	0	29	3	39	15/26 = 58%
Farmer D (Maucau)	3	1 (right)	0	14 llamas	0	17	29%
Farmers E and F (Quishuarani)	15	4 (1 left; 3 right)	13	0	0	75	-
Farmer G (Quishuarani)	2	1 (right)	16	0	0	22	-

*Cryptorchidism refers to 1 or both testicles not descended into the normal location in the scrotum. This adversely affects sperm production from the affected testicle.

Notes:

- Farmer A
 - 2 crias suspected killed by a puma
 - 2 animals died from **Fasciola hepatica (liver fluke)** as diagnosed by fecal testing- whole herd was treated
 - Suggest limit exposure to grass near stagnant water to minimize exposure to infective stage of parasite spread by snails

- Suggest consider castrating Chaku llama machos and concentrate on breeding the larger Kara llamas
 - Temperament is also important for pack llamas, regardless of size
 - Nervous llamas may not work well for packing
- US llama packing web sites suggest llamas can carry up to 25% of their weight so to carry 100# you would need 400 lb. llamas.
- Not many that we saw were that big
- I suggest the limit be 75-80 lbs. for a fully trained llama. Steep and rocky terrain might further limit the weight also.
- BCS OK in herd.
- Farmer B
 - Gopher ears seen in 4 males- inbreeding- not sure about females
 - BCS OK in herd.
 - **Suggest fecals for *F. hepatica*** to determine the extent of the liver fluke problem
- Farmer C
 - Most were Chaku llamas
 - Hembras and machos together all of the time
 - No males are being castrated
 - suggest starting that practice so that only the best machos are used for breeding if both sexes are to be kept together
 - minimum age is 1.5 years for castration surgery; there will be leg and joint problems if it done sooner
 - They can use geldings for packing
 - In the day time animals are in the mountains; night time in corrals near farmers' homes.
 - Suggest fecals for *F. hepatica* to determine the extent of the liver fluke problem
 - BCS OK in the herd
- Farmer D
 - Llamas and alpacas together
 - Machos with hembras December to March
 - Suggest fecals for *F. hepatica* to determine the extent of the liver fluke problem
 - *29% pregnancy rate- poor quality machos; need a new one.*
 - *BCS low in the herds- alpacas and llamas*
 - Check for *Fasciola*
 - Need better pasture or more time on pasture
 - Not very good animals- many huarizos and small in size
 - Use geldings for packing?
 - Checked 4 alpacas for mange; crias mixed in
 - 1 bad case treated by NP with Vaseline
 - owner injects even mild cases with ivermectin; suggest they not treat mild cases
- Farmers E and F
 - Only males in herd- 75 total
 - Why do they have so many llamas?
 - Are all being used for packing?
 - Good size llamas for packing
 - BCS OK in herd
 - Suggest fecals for *F. hepatica* to determine the extent of the liver fluke problem
 - Should keep animals away from trout lake near llama pastures to reduce exposure to snails carrying liver flukes
- Farmer G
 - Good size llamas for packing
 - BCS OK in herd
 - Suggest fecals for *F. hepatica* to determine the extent of the liver fluke problem

Seminars presented to llama producers:

- To Llama Pack Project Staff and NP Veterinary Team
 - Dr. Gerardo Diaz- Introduction to South American Camelids- historical perspective, anatomy, nutrition, behavior, reproduction, health, common misconceptions
 - Dr. Steve Purdy- Nunoa Project work with alpacas in Puno and llamas in Cusco- reproduction improvement program, enterotoxemia vaccination program, breeding animal evaluations, pregnancy examinations, responding to producers' concerns
 - Alejandra Arias-Stella- goals and work of Llama Backpacker, collaboration with Nunoa Project and CONOPA, community work with llama farmers
- To approximately 30 Llama Farmers at Quishuarani-
 - Dr. Gerardo Diaz- Health in South American Camelids- cria diseases (enterotoxemia, pneumonia, coccidiosis, diarrhea); adult diseases (conjunctivitis, otitis, osteomyelitis, mange, lice, gastrointestinal parasites including liver flukes (*Fasciola hepatica*), hydatid disease, *Sarcocystis*, alpaca fever)

General Suggestions for the Llama Project:

- Low pregnancy rates suggest **poor quality males and/or females**. This needs correction.
- The equine **fecal contamination problem on trails** in Quishuarani which is also spreading into streams is obvious.
 - Using llamas would eliminate that issue by nature of their defecation practices.
 - Some of the mules and horses seen were in poor condition; most were OK
- These 2 items are what the Llama Pack Project has asked us to help with in addition to any animal health issues we discover.
- The problem of **liver fluke disease** in llama herds needs further investigation and solutions
 - Fecal examinations should be performed on herds to determine the extent of the problem
 - A combination prevention and treatment plan can then be formulated involving:
 - Medical treatment as needed
 - Prevention of exposure to snails carrying the *Fasciola* infection which they transfer to plants which the llamas then eat
 - A survey of the drinking locations for the herds should be carried out now
 - Animals should be kept away from ponds and other standing water areas
 - Sand or stones could be used in specified drinking areas to remove the plants which carry the infection

WE NEED YOUR HELP!

This work and that of Nunoa Project's North American Camelid Studies Program in the US is all funded by donations from camelid producers in the US.

If you are interested in more information or in making a donation please contact Dr. Steve Purdy at srpurdy@nunoaproject.org or 413-658-7718. Donations can also be made through our web site at www.nunoaproject.org.