



FLOWERDALE ESTATE ALPACAS

Genetics

SMALL, UNDERSIZED, PETITE, COMPACT, DWARF OR VERTICALLY CHALLENGED?

Does size really matter?

We have a petite Gal in our herd that persists in producing compact offspring, and we have been given two more “smallies” who look as though they may do the same. I have spoken independently to two visitors to Arequipa, Peru, who saw a group of 20 or so “dwarf alpaca” as part of the street parade associated with the National Show. Where could they have come from?

Recent research indicates that the alpaca is a hybrid resulting from the union of guanaco (70-90 kg) and vicuna (35-40 kg). If the genes controlling the size and weight of the vicuna are still in the current gene pool, it will be possible to produce animals that are more vicuna-sized than guanaco-sized, or somewhere in between. If one can view a group of 20 or so such animals within the last 5 years, obviously the “small is beautiful” vicuna genes are still present and working well.

I am not aware of any report of such animals from Chile, but the existence of small critters in Peru suggests to me that this trait is Peruvian in origin. I do not doubt that any “undersized” males were selected out of imported herds by the screeners, but this would not prevent the importation of other males or females carrying the “smallness” genes, which can then manifest their presence in following generations.

What do I regard as a normal sized alpaca?

I consider “size” as made up of “weight” and “height at withers”. Because it can take 24 to 30 months for an alpaca to achieve adult height and weight, I reserve judgement on critters under 12 months, especially females; these frequently blossom after mating.

I like to see mature alpaca weighing 65 to 90 kg; more importantly, I like to see them standing 90 to 100 cm. at the withers. Anything shorter than 85 cm at the withers at 30 months or older has me looking for reasons. Was there a lack of mother’s immuno-gamma-globulins in the colostrum in the first 24 hours? Did the cria not get sufficient colostrum? Did mum stop milk production within 6 to 8 weeks of birth? Has the cria a heart defect or a bowel defect or did it have an ulcer? Did it have access to good pasture or supplementary feeding, especially at and after weaning? Did it have a severe worm infestation to cope with after weaning?

If you are seeing this adult for the first time, you won’t be able to answer most of these questions. I used to lump them all-together as examples of Vitamin D/phosphorus deficiency as weaners or young adults, and couple this with an expectation of normal sized offspring. However, I am now finding instances where a small mum produces small offspring that grow up to be small adults.

For example ...we have two 7-year-old Chilean girls 72 and 79 kg, standing approx. 95 cm. at the withers. When we bought them in 1997 we mated them to a “compact” Peruvian sire but by no means a “shortie”. In due course they both unpacked to give us a 7.5 kg male who, as a 5 year old wether, weighs 74 kg and stands 90 cm. at the withers. The other offspring weighed 6.5 kg at birth and at 5 years of age weighs 72.5 kg, but is only 84 cm. at the withers, compared to her 95 cm mother.



FLOWERDALE ESTATE ALPACAS

No Worries, we thought! We'll send Our Gal to a Big Boy. So we sent her at 57 kg to a 90 kg Peruvian macho! The result was a 5 kg male cria that weighed 42 kg at 16 months and 50 kg at 2 years and stands 80 cm. at the withers.

Our second attempt at redressing the size difference was to mate Our Gal to a 90 kg Australian Hunk, with a North Chilean background, standing 95 cm at the withers! The result was a 5.2 kg boy that currently weighs 36 kg at 12 months and is 70 cm at the withers.

Our third attempt, with the same Hunk, has given us a 7 kg female who is visibly (10 cm) shorter than her 8 kg half-sister born the week before to an 82 kg mum. The mother of Our Gal, the 95 cm, 72 kg Chilean mentioned earlier, has gone on to give us a 6 kg male and a 6.5 kg girl who do not seem vertically challenged. The boy was sired by a Tall, Dark, Handsome sire with no suggestion of compactness, and the female by a 70 kg Australian youngblood standing 90 cm. at the withers.

But there's more.

We have been given 2 diminutive Peruvian half-sisters. Mum appears to be of normal stature and proportions, and has produced an offspring of normal size. The two sires of these gals are of good stature and have not to date (7 years and 2 years) thrown other "small" offspring.

At 2 years old the elder stood 82 cm at the withers and weighed 42 kg. She was mated when 3 years old, when she stood 82 cm. tall and weighed 42 kg. Mated to an 80 kg, 90 cm. Australian male, she gave us a 5kg male cria who is diminutive, weighing 11.2 kg at 3 months; the next cria born 2 weeks later to a 79 kg mum was 8.8 kg at birth and weighed 19.2 kg at 2 months. The younger gal weighed 26 kg when she came to us at 12 months of age. She was mated 6 months later when she was 34 kg. and 80 cm. at the withers. She is now 7 months pregnant, weighs 54 kg and is 82 cm tall at the withers.

We have another gal that we nearly lost at 15 months of age with severe Vitamin D/phosphorus deficiency brought on by a 15 months fleece maintained for the show season. Never again! She fell to 31.5 kg, and was only 33.5 kg at 17 months, when she was mated. She grew upward and outward after mating, to be 55 kg after delivering her first 9.5 kg cria. She now weighs about 68 kg. and has short legs for the size of her body. All her cria have been of normal stature, and she is one of the gals whose "stuntedness" can be explained on other than genetic grounds.

So how would inherited genes affect size?

Multiple hormones can act together to produce multiple effects. For example, reproductive steroids, oxytocin, and corticosteroids all work together to control pregnancy, foetal development, and birth. It also happens that a single hormone can have many actions; the hormone produced by the thyroid gland affects the manufacture of various enzymes, as well as red cell production, bone turnover, and carbohydrate and fat metabolism.

The production of these hormones is initiated by messages from some of the genes that the foetus gets from its sire or dam. Hence my concern that we may have genes from the ancestral vicuna that is telling some our foetuses to develop glands that produce smaller amounts of hormone, because "small is beautiful".

So, what's wrong with a little alpaca?



FLOWERDALE ESTATE ALPACAS

Nothing. A small alpaca is probably as healthy as a big one, and requires less feed to maintain itself. However, size is related to surface area. Our 42 kg Peruvian has a lovely, dense, 18 micron fleece, but her surface area is 1.2 square metres. If I have a 70 kg gal with an 18 micron fleece of equivalent density, she has a surface area of 1.7 square metres, or 42% more skin to produce more fleece. The majority of this will be body surface area rather than leg area, so that the resulting increase in fibre production should enhance your financial return.

If I can find a male that will persuade Our Gal to produce cria that are 90 cm tall at the withers, with equivalent or better fleece density and fineness, I should expect to get another 15% of fleece more than I get from her 84 cm mother. If I can persuade the 42 kg Petite Peruvian to produce offspring that take after the 80.1 kg sire and have her fleece characteristics, I should get 54% more fleece from the offspring than the mum. Conversely, if I arrange a mating of a 72 kg mum and get a 54 kg offspring, I will get (all other things being equal) 20% less fleece.

Of course, all things are never equal. Fineness, density, C.V., comfort factor, staple length, temperament, and many other factors must be taken into account when you plan a mating, because they will all have an effect on the quality and volume of fleece the offspring will produce, how easy it is to manage, and how easy it will be to mate or handle. I can just hear some cynic say that the only measurable parameter that will have no direct effect on any of the above is the sum of the show ribbons won by its sire and dam.



Dr Richard Dixon B.V.Sc veterinarian, author and co-owner of Berridale Alpacas in Australia