

Fact sheet 7. Measuring goat growth using mathematics



MOHAIR AUSTRALIA
YOUTH PROGRAM

It is important to track how well your goat herd is doing and whether you need to make any adjustments to your management. One way to do this is to use mathematics (maths) to help you evaluate the growth of your goats and their mohair fleece.

If you want to work out how well your goats are growing compared to other students' goats, you can weigh them and record the weight. Then you can use maths to see how they are doing.

In their first three months, most healthy angora goat kids will gain around 250 grams in weight per day until they reach 10 kilos. There are some variations including:

- kids from triplet litters will tend to grow slower than kids that are singles
- bucks will tend to grow faster than does
- kids from yearling dams will tend to grow slower than kids from older dams.

If a kid is not growing at the expected rate, some of the common reasons are that the kid may:

- have an internal parasite like worms or coccidi
- not be getting enough milk from his dam or from your bottle feeding,
- be on a poor-quality milk replacer
- have a health problem or a disease.

The issue may also be related to genetics. Try offering them a creep feed (using solid food to supplement milk) that is high in crude protein (14–18%) and energy, as well as some alfalfa or grass/legume mix hay.

Kids that are getting a lower amount of milk will usually investigate other feeds sooner and eat more of them. This means their rumens may develop earlier.

An angora wether can continue to grow until it is four years of age.

Mathematical equations for growth

When the goat arrives, use a hanging scale or weigh yourself on your bathroom scales and then stand on it again while holding the goat and calculate the difference.

For example, if on your own you weigh 32 kgs, and while holding the goat you weigh 46 kgs, then it weighs 14 kgs ($46 - 32 = 14$).

You can also use a goat weight tape to estimate the weight, but that isn't as accurate as using scales.

Weighing the goat at regular intervals will give you the means to calculate average daily weight increases.

If you have two measurements written on the wether record sheet and you calculate how many days there were between the weighing, you can express growth rate as daily weight gain.

For example:

- On arrival 15/4/2020, the goat weighed 32 kgs
- One month later 15/5/2020, the goat weighed 33.5 kgs

Using a calendar, you can work out there was a total number of 30 days between weighing. During that time, the goat gained 1.5 kg.

How much weight did the kid gain in 30 days? $32\text{kgs} - 33.5\text{kgs} = 1.5\text{kgs}$ or 1,500 g.

To calculate daily weight gain, $1,500 \div 30 = 50$ g. This weight gain is not enough. The aim should be 100 g per day or 700 g per week for growth of 2800 grams over four weeks.

You can work this out for any time period using the same formula. If you record growth each month, you will see the rate of growth will usually slow down as the goat matures.

Suggested activities

Use your wether records to calculate their daily weight gain. How do they compare to each other? How well do you think they are growing?

Use a graph to show the weight of your wether each week or per month of age, depending on how often you weigh it. What does the goat's growth curve look like? Is it very straight or starting to flatten out? Chart the goat's average daily weight gain for the same time period.

Try some calculations:

- A wether gained 9 kgs in 60 days. What was its daily rate of growth?
- Your wether eats 4.5 kgs of a 15% crude protein feed in a month. How many kilos of protein did it eat in total that month?
- Which has more protein: 4.5 kgs of a 15% crude protein feed or 6.8 kgs of a 20% crude protein feed?