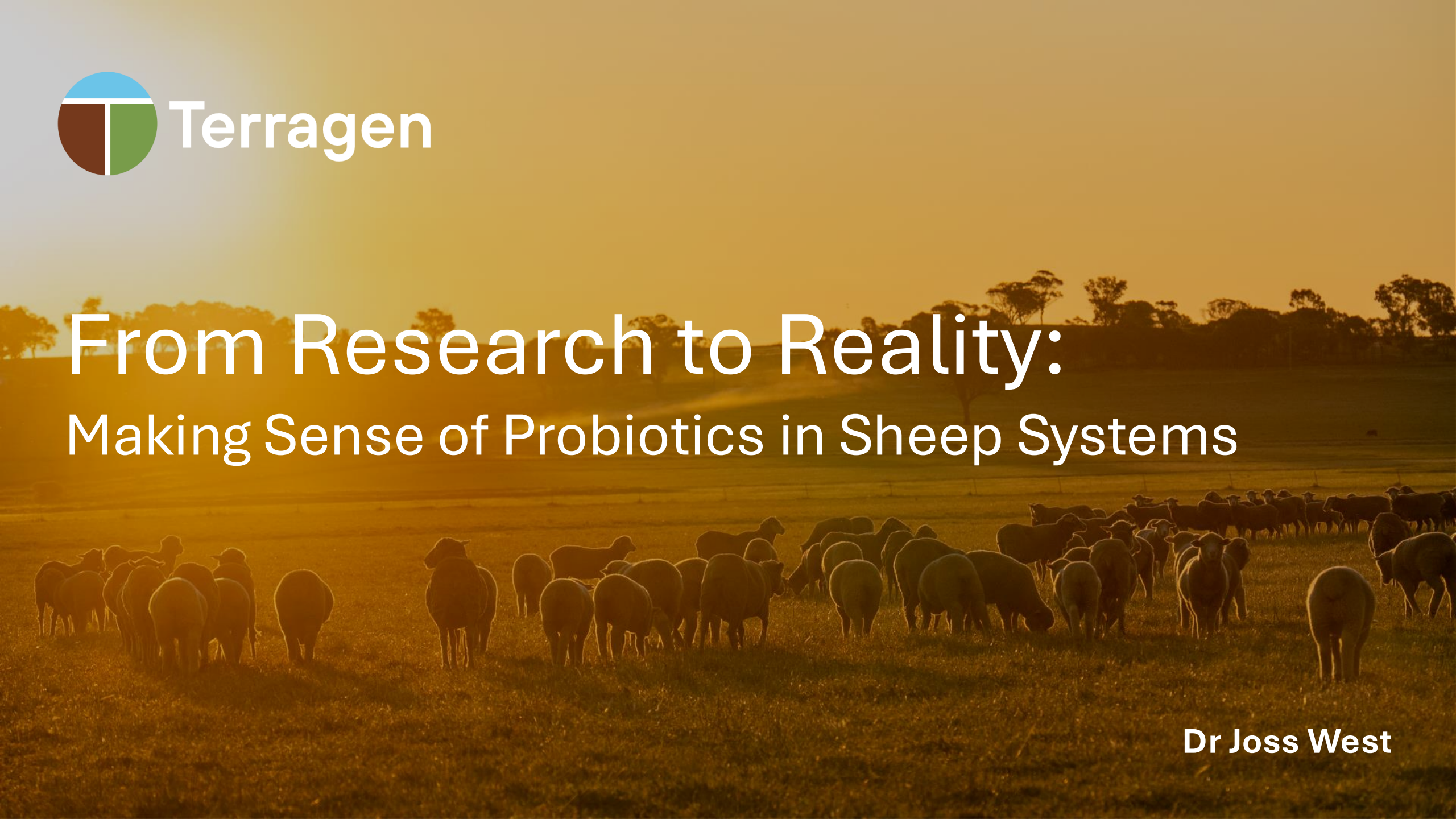


From Research to Reality:

Making Sense of Probiotics in Sheep Systems

Dr Joss West

WHO AM I?

- Veterinarian working across ruminant systems
- Strong interface between science and commercial production
- Lived experience alongside nutritionists and producers

Dr Joss West

Chief Operating Officer, Terragen Biotech

MY JOURNEY WITH PROBIOTICS

I spent years studying “bad bacteria”.. I had questions!

Do probiotics actually work?

How do they work?

Why do results vary between animals, diets and production systems?

I wanted solutions to improve rapid diet transition s initially.

This is how my work with **Terragen** started.

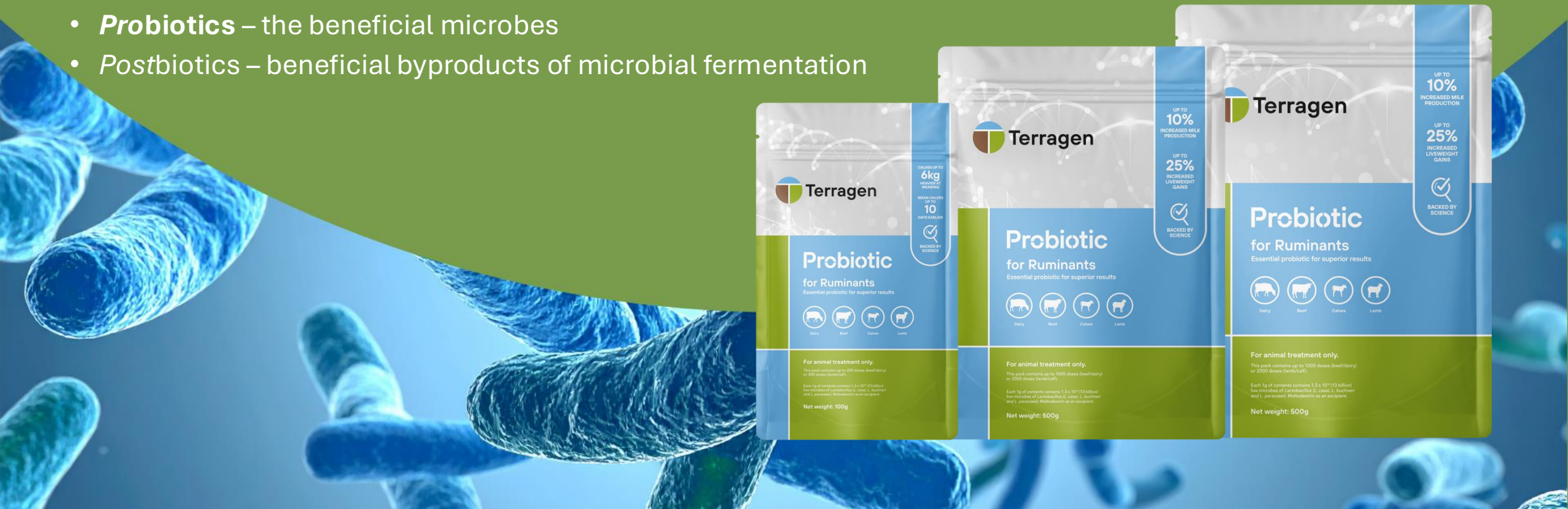
Taking the science behind probiotics and asking how it translates into animal health, performance and practical use on farm.

I also really like cheese, sourdough and wine.....

WHAT ARE PROBIOTICS?

Probiotics (or direct-fed microbials) by definition are live microorganisms selected to deliver a benefit to the host - through support rumen function, animal health, and/or feed efficiency.

- *Pre*biotics – food for beneficial microbes
- ***Pro*biotics** – the beneficial microbes
- *Post*biotics – beneficial byproducts of microbial fermentation



SHEEP ARE NOT LITTLE COWS

Sheep and cattle are both ruminants, but the way they eat, digest and respond to supplementation is different.

We often adopt cattle learnings, but sheep systems are fundamentally different:

Grazing-dominant | Variable intake patterns
Different rumen dynamics

Why this matters? - These differences impact:

Microbial establishment | Supplement delivery
Consistency of response

Outcomes in cattle
don’t always translate to sheep.

WHAT DID LITERATURE SHOW?

Reviewed

76

published studies globally looking at sheep / lambs supplemented with probiotics

Included grazing and intensive production systems; growing lambs, grazing sheep and dairy ewes

Research spanned

20 years

(2006-2026)

Average animals per trial

35

(spanning from 2 sheep to 160 lambs)

Average length of trial

~70 days

with research spanning 2 days to 6 months

100%

of trials found a positive outcome

Dose application:

90% powders;

5% mix of capsules, liquids & suspensions,

rest unspecified – powder delivery dominates published literature

LIT REVIEW LEARNINGS

Single strain vs multi-strain products

46% vs 54%

Most common microbes:

Lactobacillus spp.	54%
Bacillus spp.	46%
Saccharomyces spp. (yeast)	45%
Enterococcus spp.	13%
Bifidobacterium spp.	11%

Doses ranged from

10^5 (100 thousand) to 10^{13} (1 trillion) CFU and most common strength was 10^9CFU/g (1 billion)

Research focus:

Animal health/health promotion as a primary or secondary metric	76%
Growth performance	80%
Digestion / feed efficiency	40%
Rumen function / microbiome	47%
Methane reduction	11%
Meat quality	16%
Immune function	9%
Milk production	6%

Growth performance and improved animal health metrics are the most frequently reported production benefits

LIT REVIEW LEARNINGS

KEY POINTS

- Research shows that probiotics overwhelmingly deliver benefit in all published literature
- Probiotic efficacy depends on far more than simply increasing dose; and single strain
- Strain selection, viability and delivery method are equally important determinants of performance.
- Despite Australia having one of the world's largest sheep industries, there are remarkably few peer-reviewed Australian probiotic supplementation trials in sheep and lambs.
- FAOSTAT ranks Australia 3rd (behind China with 183m & India with 115m) with national herd of 73m

Where has research been conducted?

Mostly in China (20) and Egypt (12).

2-5: Turkey, Iran, Brazil, Malaysia, Mexico.

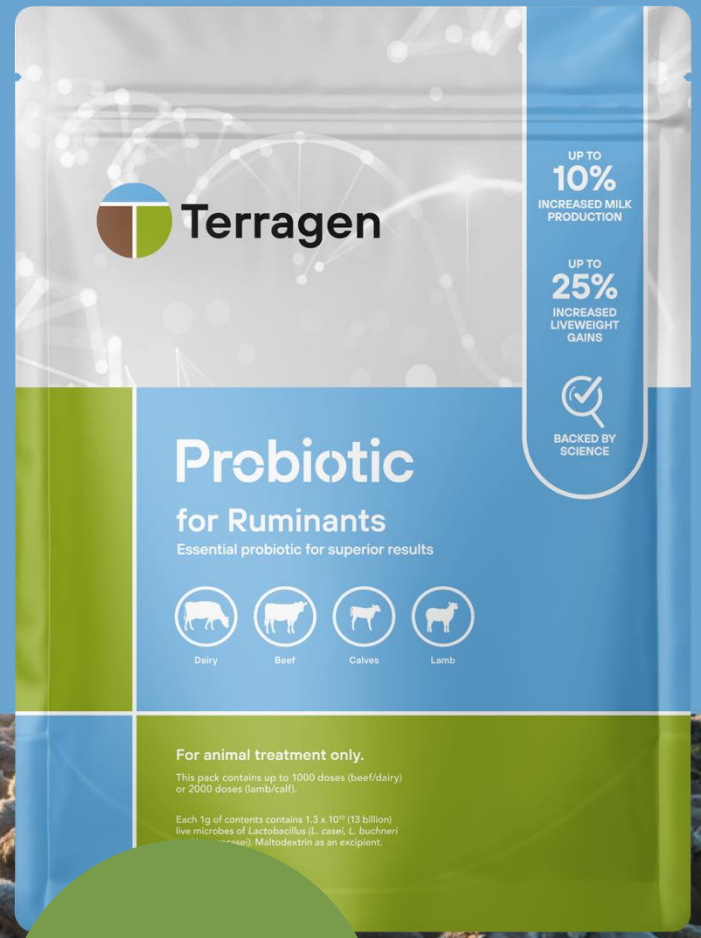
≤2: **Australia**, Saudi Arabia, Poland, Indonesia, Ukraine, Russia, Uraguay, USA, France, Croatia

AUSTRALIAN PEER REVIEWED PUBLICATION

Nair et al., 2006: *Freeze-dried Lactobacillus spp. Improved average daily liveweight gain and reduced methane intensity in growing lambs*

MERIL 2 Program; Hamilton SmartFarm, VIC (DEECA)

68hd completed trial following training to C Lock Smart feeders, 70d trial following adaptation to feeders



+25% increased liveweight

+24% higher average daily gain

+1.8kg heavier **+ 40g** per hd/day

+30% reduction in methane intensity

+28% improved BCS

WHAT THE RESEARCH SHOWS

Strong evidence:

- Growth / Performance
- Animal health outcomes
- Digestibility

Variable:

- Meat quality
- Feed intake

Emerging:

- Methane reduction
- Early-life programming
- Immunology

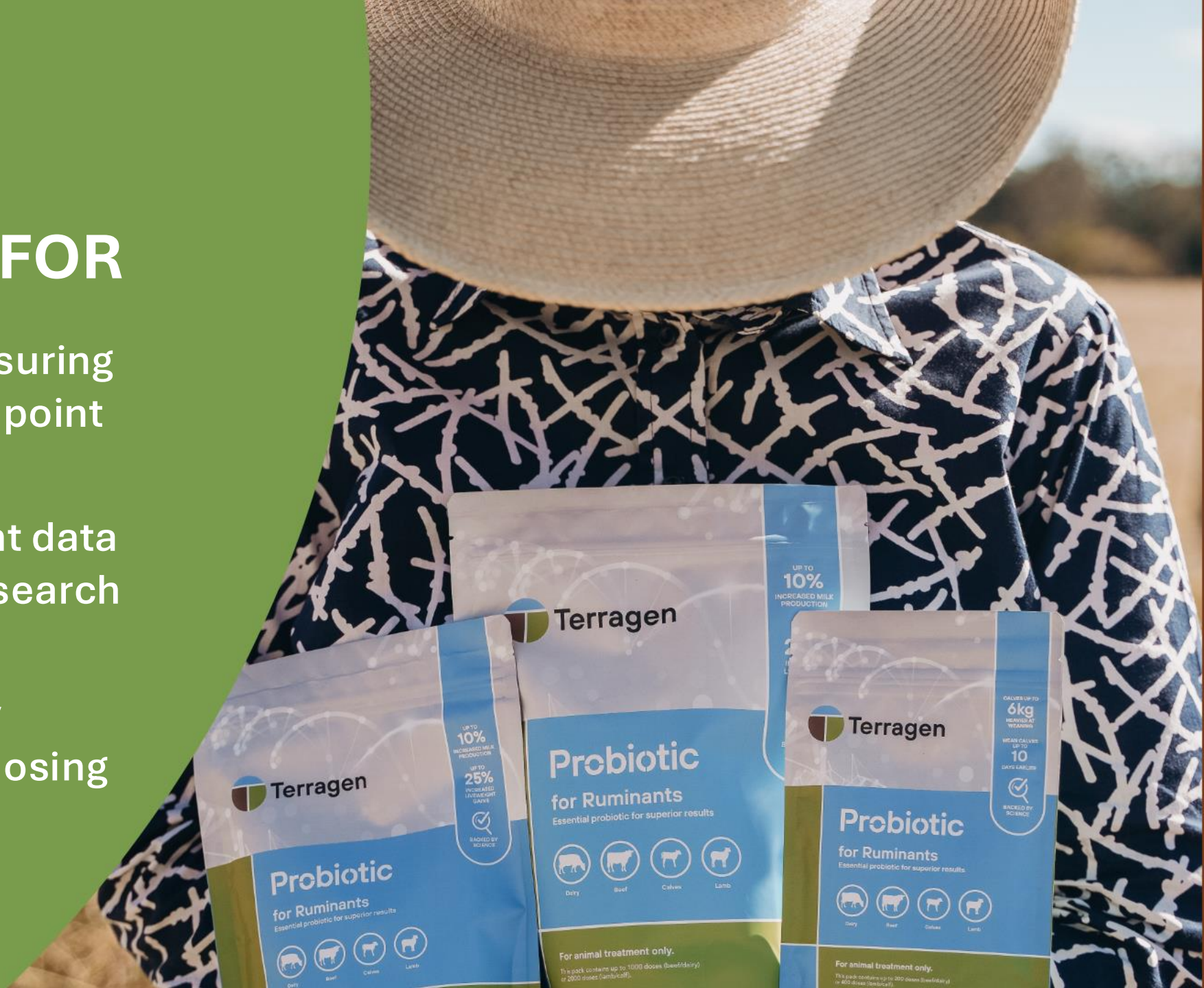
FUTURE RESEARCH / OPPOURTUNITIES

Where research is heading

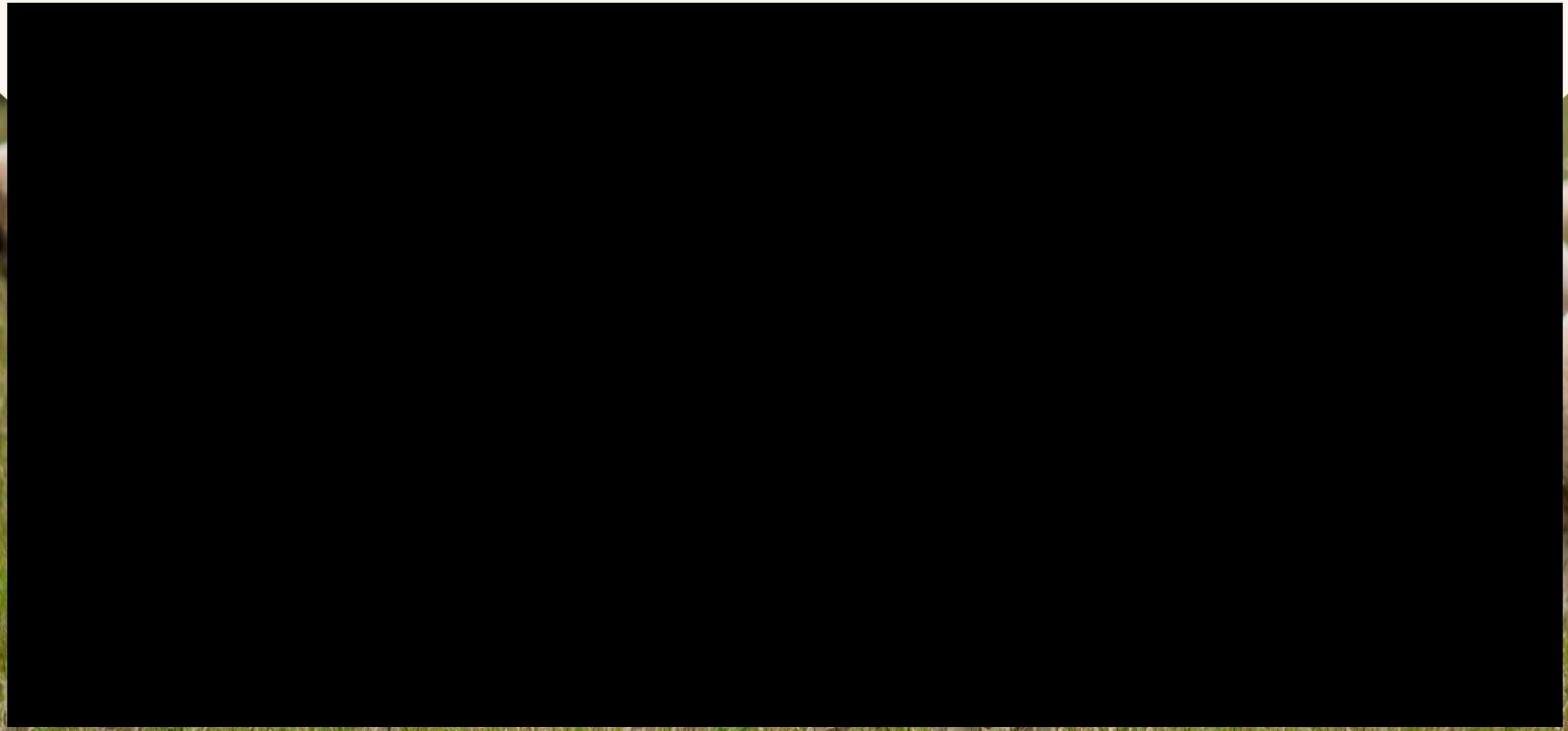
- Commercially relevant research – scale & settings
- Improved delivery technologies & seamless integration – water? Grazing systems?
- Clear reporting on ROI
- Drive investment in Australia

REMINDER
WHAT TO LOOK FOR

1. Quality standards ensuring viability (live bugs) at point of ingestion
2. Sheep/Lamb- relevant data – quality scientific research with proven strains
3. Support with delivery system - consistent dosing



WHAT PRODUCERS SAY



QUESTIONS

Got questions about Terragen Probiotic For Ruminants?

Talk to the team at the Terragen stand today!

www.terragen.com.au