



START STRONG, FINISH STRONGER



October 2025



Czech Republic



Arjan Meijerink



OUTLINE

- Introduction
- Why calve heifers at 24 months?
- Benefits of feeding more milk
- Milk replacer ingredients
- Role of starter feed & how to encourage intake
- Calf trials demonstrating how to balance the intake from milk & starter feed on farm





LET ME INTRODUCE MYSELF



Arjan Meijerink

Sales Director – EMEA & APAC

1994-2002 Dairy management in EMEA
2002-2019 ForFarmers Germany
2019 –now Denkavit





Volac Milk Replacers



A dedicated Milk Replacer Business – committed to growth

Denkavit purchased the Volac Milk Replacers business and 25 of its associated staff on the 22nd December 2023 with a view to being a fully committed milk replacer business.

Volac Milk Replacers remains a **locally run** business with all commercial activities and farm trials based in GB & Ireland, however, has the added support and resource of Denkavit, with new access to raw materials.

A customer orientated business, flexible with formulations and bespoke additives.



YOUR PARTNER FOR PERFORMANCE

Premium milk replacers manufacturer – recent customer insights describe VMR as Quality, Consistent and Reliable.

We are here to help our farmers and merchants grow their business *in the best way they can, whatever their business capabilities and objectives.*

A market orientated company operating in the premium sector for calf rearing. VMR aim to support an efficient dairy/beef industry for a sustainable future by providing technically validated solutions and resources to enable farmers to achieve their calves full potential.

YOUR PARTNER FOR
PERFORMANCE



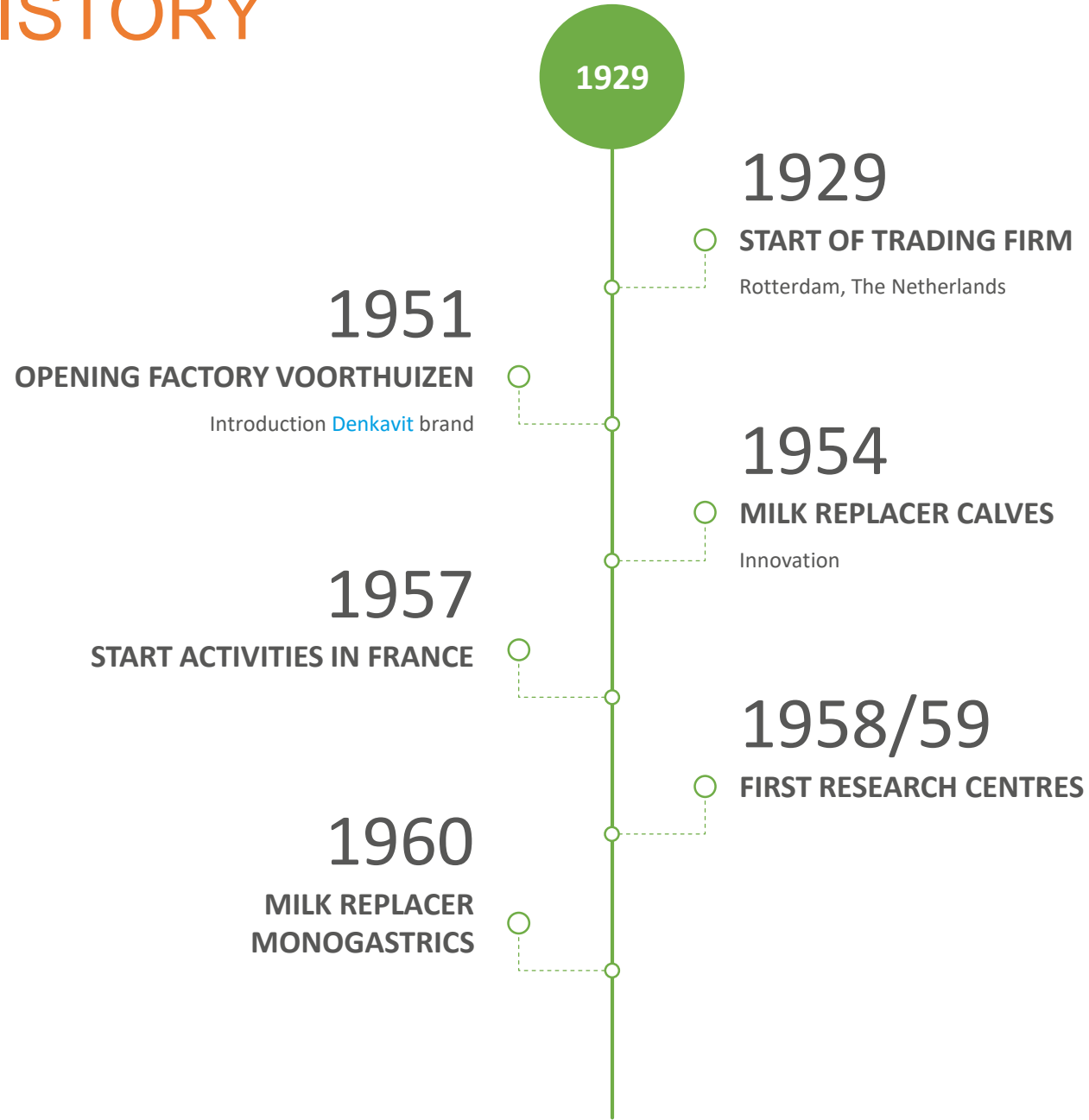
Feed for Growth promotes efficient and sustainable youngstock rearing practices. Our high-quality, nutritional solutions are scientifically formulated to ensure optimal rumen development.

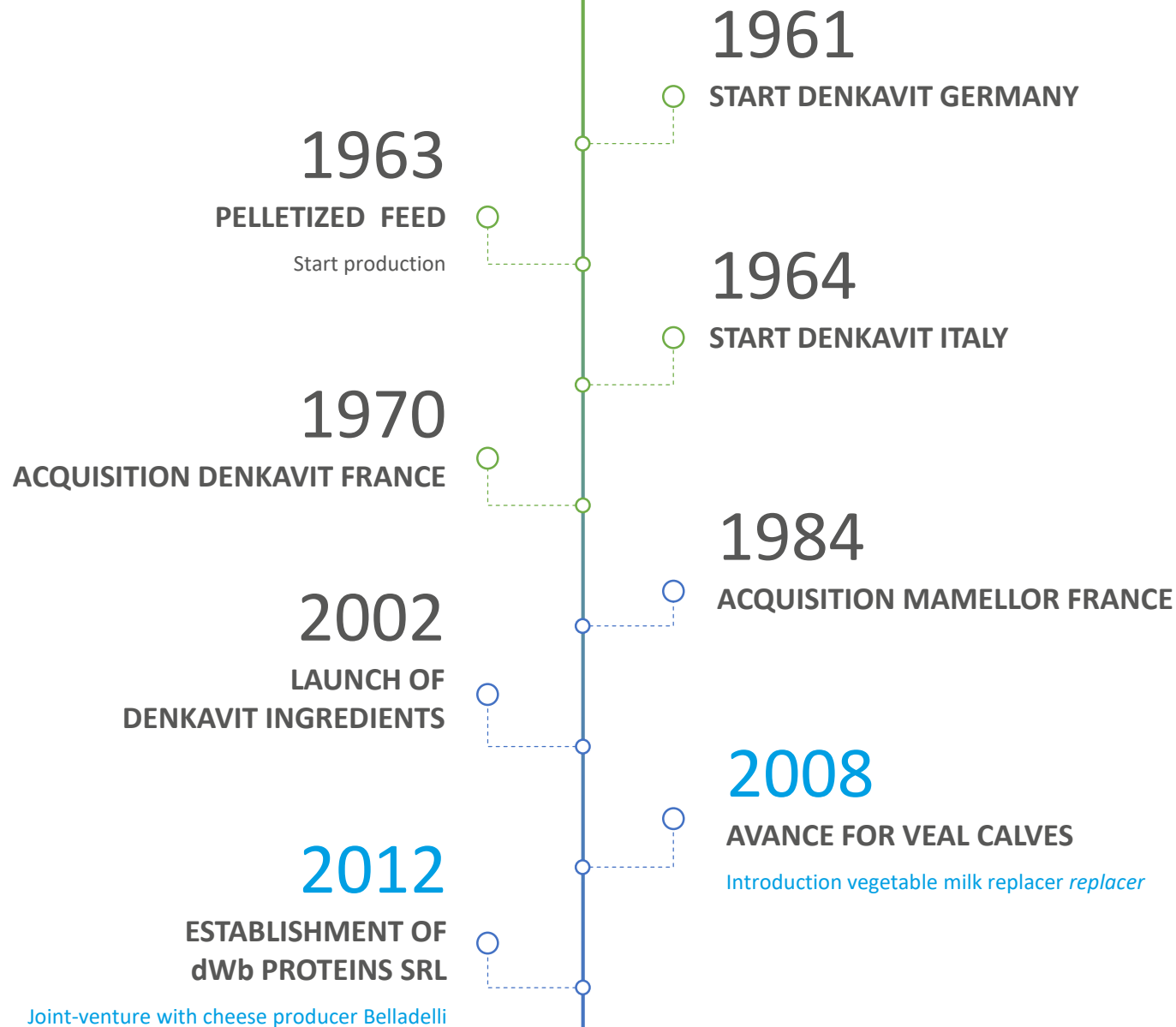
Our personalised, technically validated support helps farmers to achieve outstanding outcomes.

Through strong, mutually successful partnerships, we champion an efficient, sustainable future for calf-rearing.



HISTORY





2014
OPENING NEW COMPOUND
FEED FACTORY FRANCE

2015
EXPANSION OF INGREDIENTS
AS EUROPEAN PLAYER
Active in 17 European countries

2019
ESTABLISHMENT OF
DENKAVIT IBERICA

2019
ACQUISITION GROBER, USA

2022
ESTABLISHMENT HOLLAND
AGRO TRADING, CHINA

2024

2012
OPENING NEW LABORATORY
DENKAVIT

2014
ACQUISITION V-MILK
Vreugdenhil Feed activities

2016
ACQUISITION MAJORITY
STAKE IN FRABES, ITALY

2019
100% ACQUISITION
FRABES, ITALY

2021
ACQUISITION NUTRIFEED,
NETHERLANDS

2023
ACQUISITION VOLAC MILK REPLACER
ACTIVITIES





Denkavit a family-owned business



725
EMPLOYEES



€900 million
TURNOVER PER YEAR



>60
COUNTRIES IN WHICH
WE OPERATE WORLDWIDE



OPTIONS FOR SCIENCE
BACKED
COMPOSITIONS



+/- 450,000
VEAL CALVES IN EUROPE



900,000 ton
FEED FOR YOUNG ANIMALS
& FEED INGREDIENTS



6
PRODUCTION LOCATIONS
(3 locations where we can dry raw materials)



+/- 300
DIFFERENT INCOMING RAW
MATERIALS



Dedicated and local Research & Development



LABORATORY

- Highly committed to Research and Development
- Constantly developing new products, ideas and applications to optimize your young animals' growth and performance
- 6 laboratories



INNOVATION CENTRE

- **Local Research** and Development projects with VMR, Dr Jessica Cooke
- Three Denkafarm Innovation Centres
 - Calves
 - Piglets



KEY FIGURES R&D

- 27 Full time (equivalent) per day working on R&D at DenkaVit
- Research for more than 70 years
- On average +/- 100 examinations per year

QUALITY



FEED FOR GROWTH

volac



>6.000 calves/yr



START STRONG, FINISH STRONGER

The Future of Your Herd Begins With
High Quality Nutrition



15-16 October 2025



Czech Republic



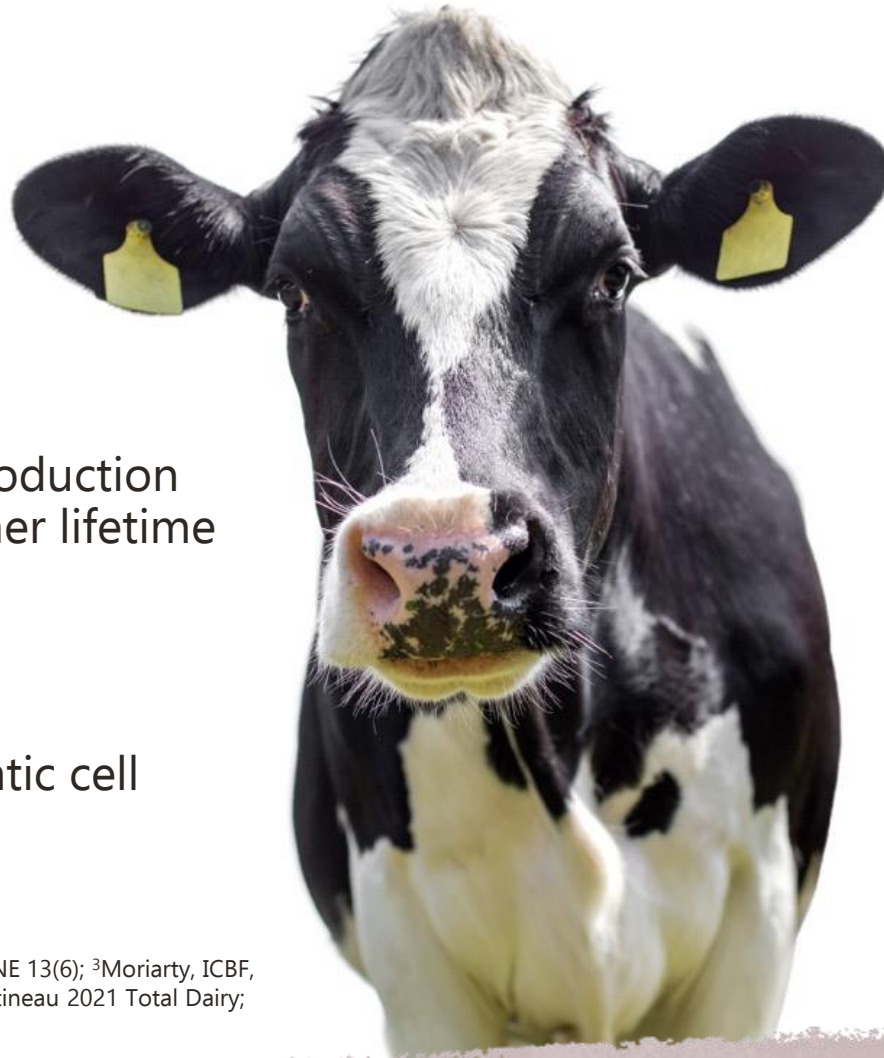
Dr Jessica Cooke BSc PhD, R&D Manager

CALVING HEIFERS AT 22 TO 24 MONTHS OF AGE IMPROVES...

- **Fertility** – Fewer days to conception¹; Lower calving intervals²

- **Milk Yield** – Higher milk production over 1st 5 years of life¹; Higher lifetime daily yield^{2,3}

- **Udder Health** – Lower somatic cell count²



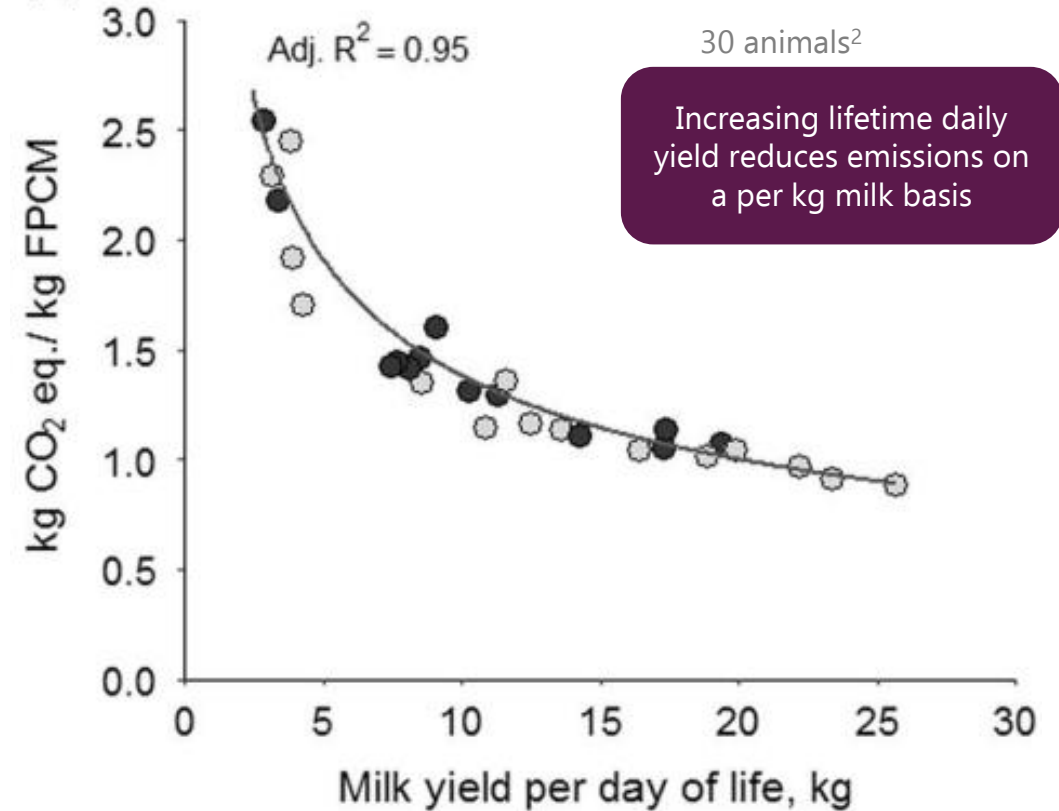
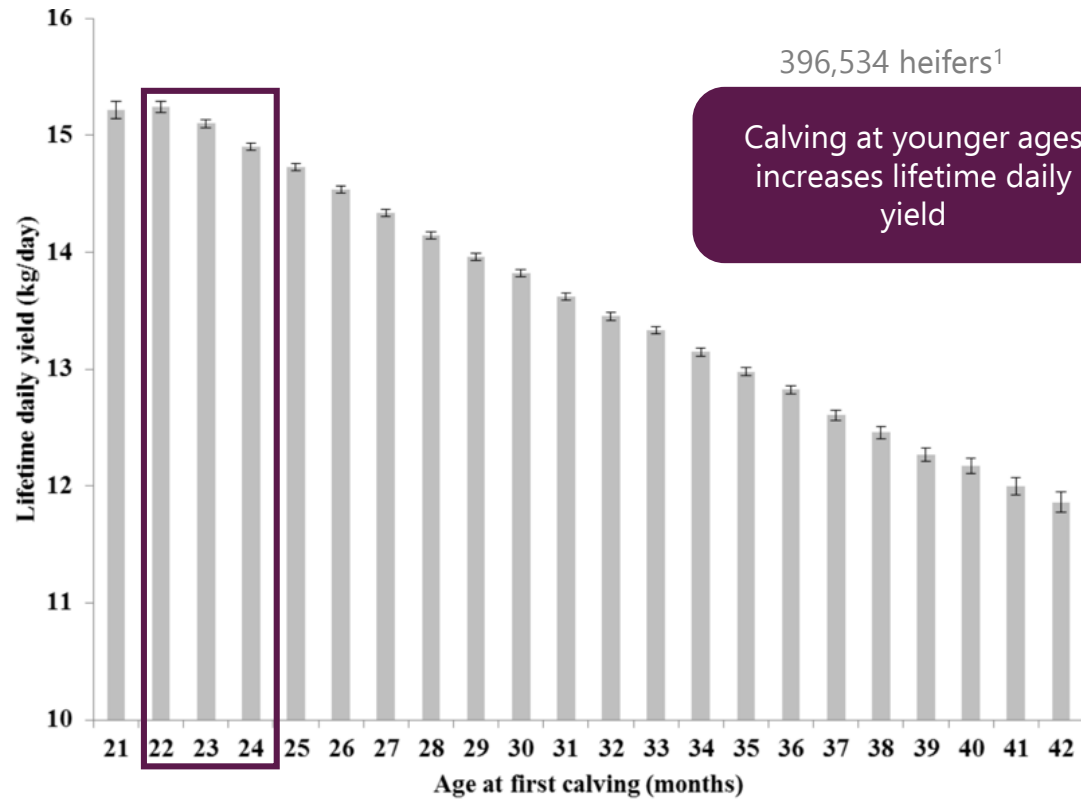
- **GHG Emissions** – Decrease kg CO₂/day⁴

- **Longevity** – Increased likelihood of reaching a 3rd calving^{1,2,3,5}

¹Cooke et al 2013 OJAS 3:1-12; ²Eastham et al 2018 PLoS ONE 13(6); ³Moriarty, ICBF, 2020 <https://www.icbf.com/wp/?p=14740>; ⁴Husband & Martineau 2021 Total Dairy; ⁵Sherwin et al 2016 Animal 10:1877-82

LIFETIME DAILY YIELD

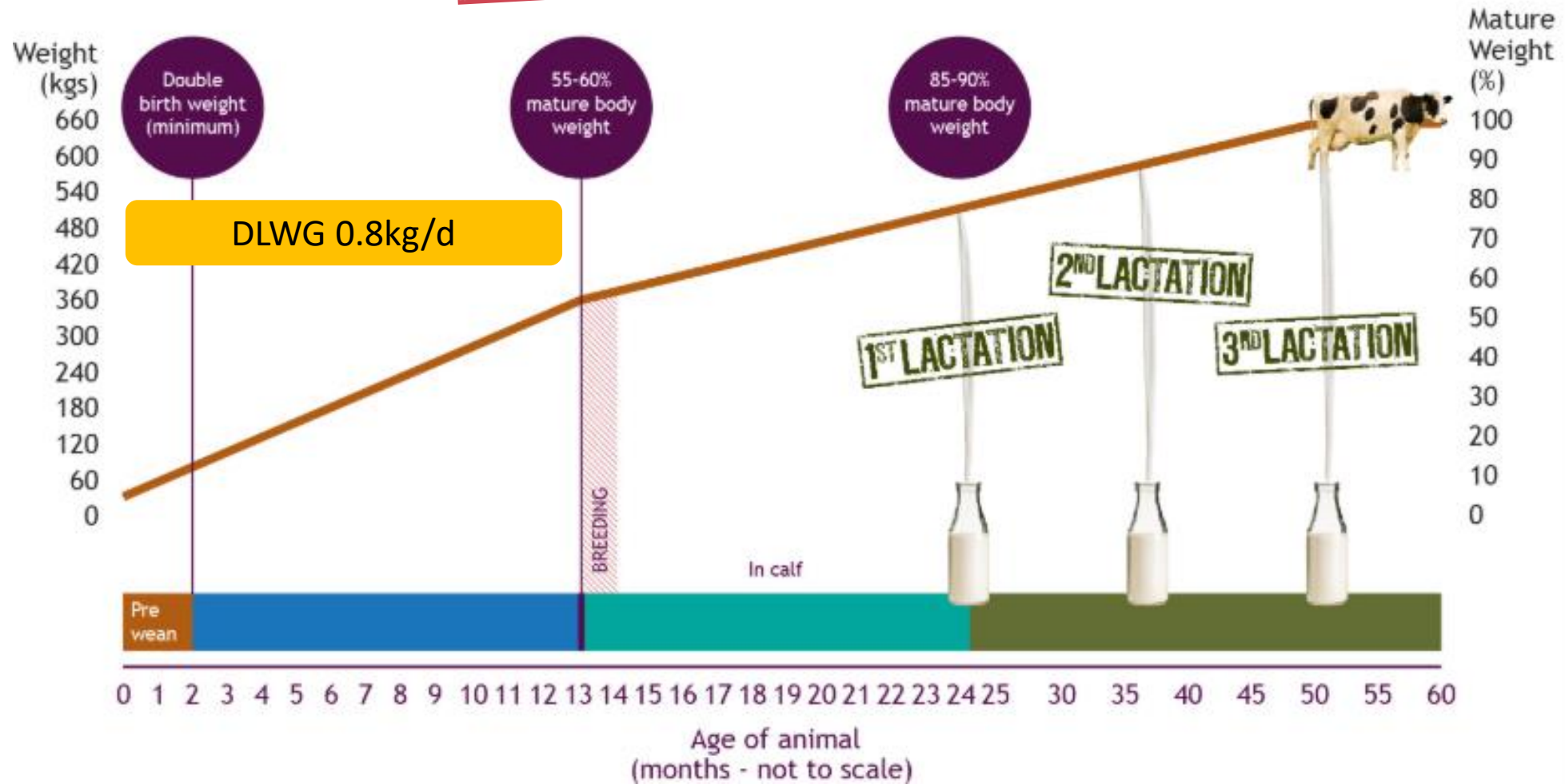
- **Lifetime milk per cow per day** is a parameter that indicates herd efficiency – it reflects fertility, health & age at first calving performance



A profitable system, with a low carbon footprint per litre of milk

¹Eastham et al 2018 PLoS ONE 13(6); ²Grandl et al 2019 Animal 13(1). FPCM=fat & protein corrected milk yield

GROWTH RATE CALCULATION
 360kg breeding weight - 40kg birth weight = 320kg.
 320kg ÷ 395 days = 0.8kg per day growth

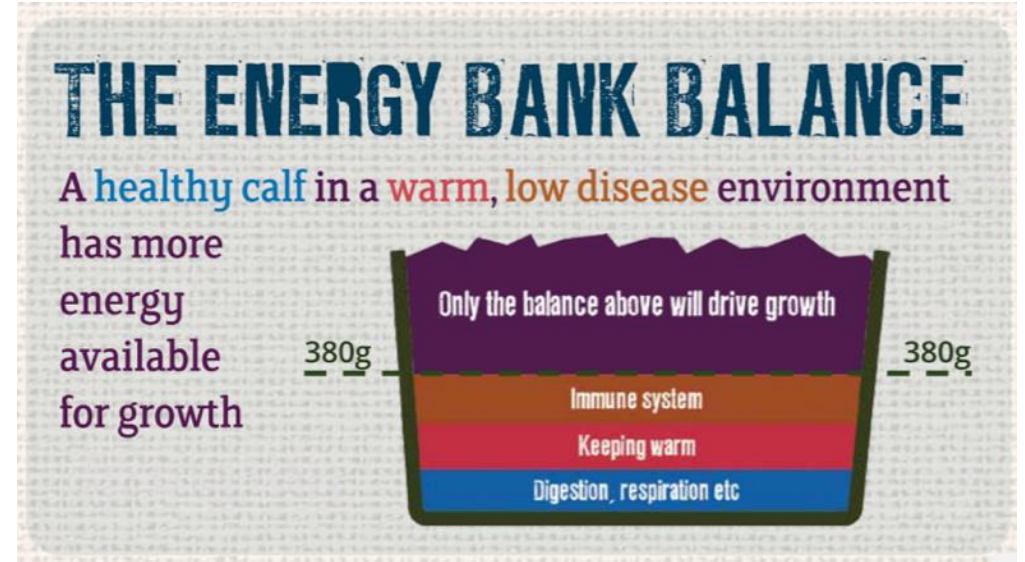


WHAT DO WE NEED TO ACHIEVE?

- Healthy calf (no mortality, minimal morbidity)
- Double birth weight at weaning
- Pre weaning DLWG of ≥ 0.7 kg per day
- Good starter intake to stimulate rumen development – transition from non-ruminant to pre-ruminant
- Smooth weaning transition with no setbacks
- Post weaning DLWG of > 1 kg per day



THE CRITICAL FOCUS AREAS FOR SUCCESS



Based on a 45kg calf requiring 7.3 MJ/d for maintenance (under thermoneutral conditions, 15-25°C)

A healthy, warm calf - *ideal*



A sick, cold calf - *inefficient*





FEEDING YOUNG CALVES MORE MILK WILL HELP...

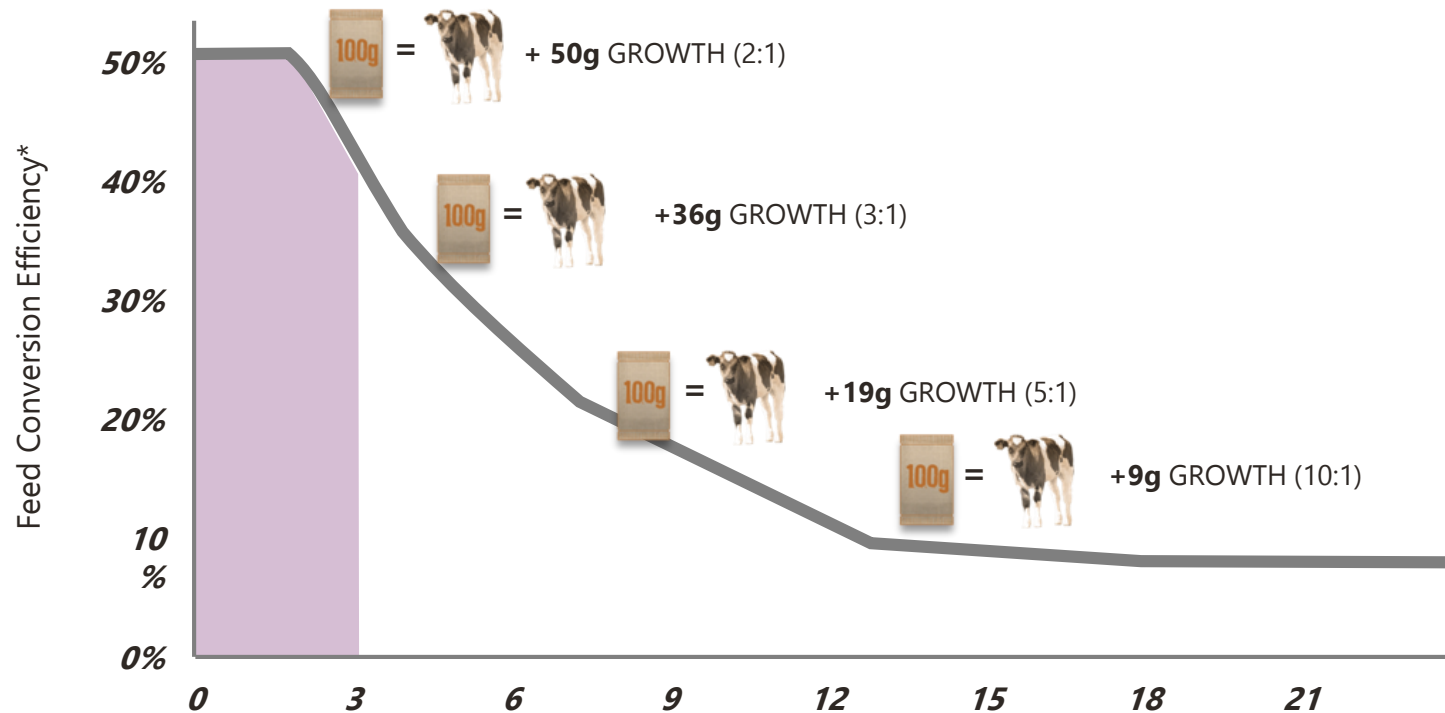
- Maximise feed efficiency*
- Prevent early weight loss*
- Maximise early growth potential
- Improve health
- Enhance organ growth & development^{1,2}
- Improve lactation performance^{3,4}

¹Geiger et al 2016 J D Sci 99:3995; ²Soberon & Van Amburgh 2017 J D Sci 100; ³Soberon et al 2012 J D Sci 95:783; ⁴Chester-Jones et al 2017 J D Sci 100:3697



MAXIMISE FEED EFFICIENCY

Feed efficiency (the relative ability of the animal to turn feed nutrients into growth) is at its highest during the milk feeding period



Example:

28d old calf (50% FCR)



900g/d

+



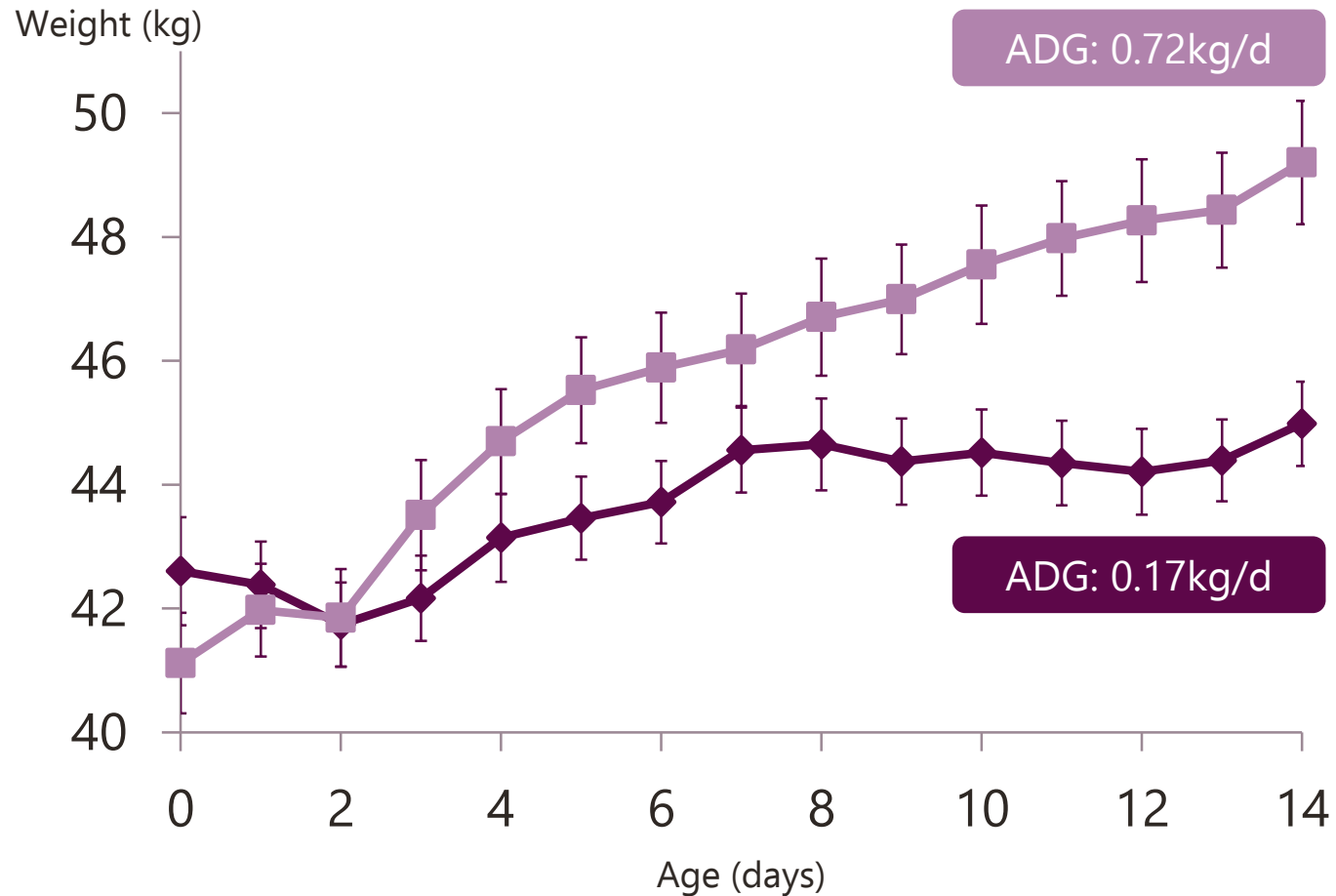
500g/d

Total feed intake = 1400g/d
Expected growth = 700g/d

*BW gain/amount of feed consumed

Bach & Ahedo 2008 Vet Clinics Food Animal Prac 24 117-38

MAXIMISE EARLY GROWTH POTENTIAL



100 Holstein female calves fed:

Ad libitum (n=50):

- d5: 7.6L/d (950g powder/d)
- d26: 13.3L/d

Restricted (n=50):

- d0-21: 5L/d (625g powder/d)



YOUR PARTNER FOR PERFORMANCE



MILK FEEDING & CALF HEALTH

Pre-Weaning:

- Feeding more milk reduced duration of scours & improved hydration, growth & feed efficiency following a *Cryptosporidium parvum* challenge at **3 d of age**¹

	Low Plane of Nutrition	High Plane of Nutrition
BW d1 (kg)	47.3	46.8
BW d21 (kg)	43.2	55.9

¹Fed MR as a function of birth weight at 0.13 Mcal/kg BW^{0.75} or 0.30 Mcal/kg BW^{0.75}

After Weaning:

- Calves fed more milk showed a better immune response to a challenge on **d80** from *Salmonella* Typhimurium² & BRDC³



YOUR PARTNER FOR PERFORMANCE












MILK ALLOWANCE & CALF HEALTH

- Peak milk allowance: 8.3 L/d (range 5 to 15 L/d)
- Days to reach peak milk allowance: 18 d (range 0 to 44 d)

Cleaner, healthier calf:

- Higher peak milk allowance (L/d)
- **Fewer days** to reach peak milk allowance

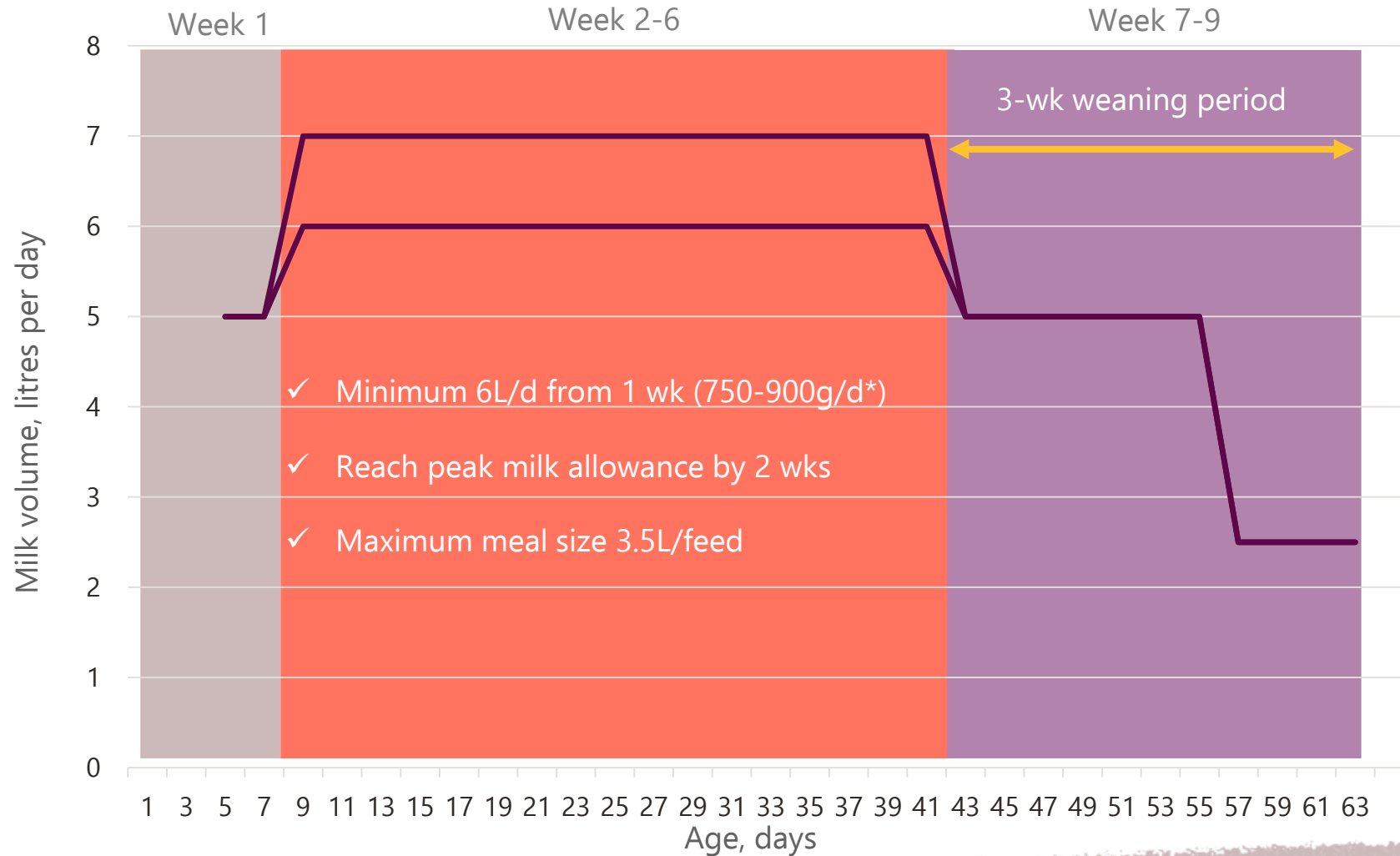
	Respiratory	Scours
		
		
<ul style="list-style-type: none"> • Clear eyes and nose • No cough <p>Normal temperature (38-39°C or 100-102°F)</p>	<ul style="list-style-type: none"> • Discharge from eyes or nose • Cough on movement <p>High temperature (>39.5°C or 103°F)</p>	<ul style="list-style-type: none"> • Severe discharge with pus • Frequent coughing/wheezing <p>High temperature (>39.5°C or 103°F)</p>
		
<ul style="list-style-type: none"> • Clean hindquarters • Well formed faeces <p>Normal temperature (38-39°C or 100-102°F)</p>	<ul style="list-style-type: none"> • Dirty hindquarters • Loose faeces <p>Variable temperature</p>	<ul style="list-style-type: none"> • Wet hindquarters • Hair loss • Dehydrated • Watery faeces <p>Variable temperature</p>

Dirty hide, sick calf:

- **More days** to reach peak milk allowance

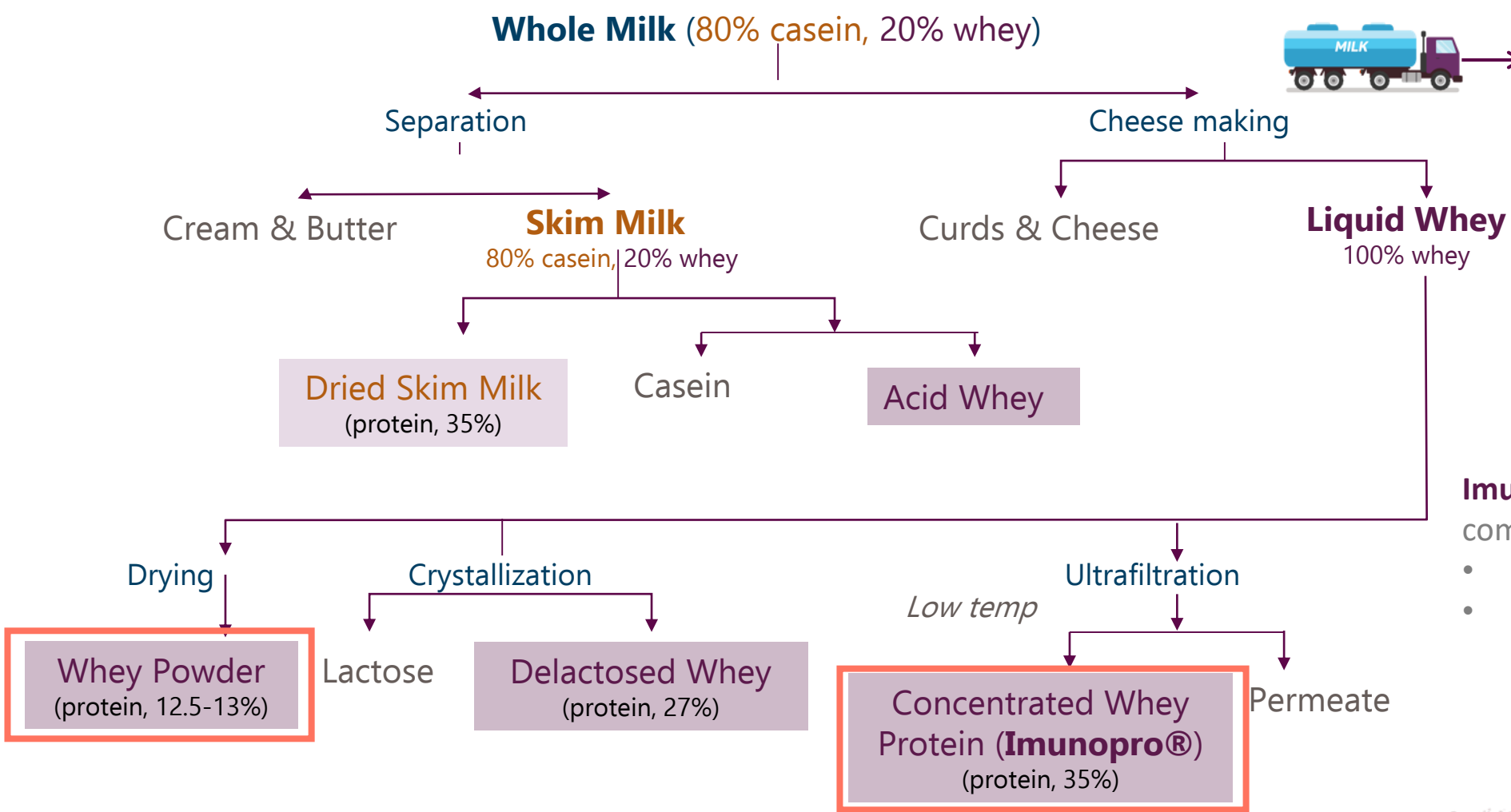
1. What is YOUR target growth rate?
2. Consider YOUR systems weaknesses

MILK FEEDING CURVE



*Milk replacer mixed at either 12.5% or 15%

MILK REPLACER INGREDIENTS



Imunopro® retains bioactive components:

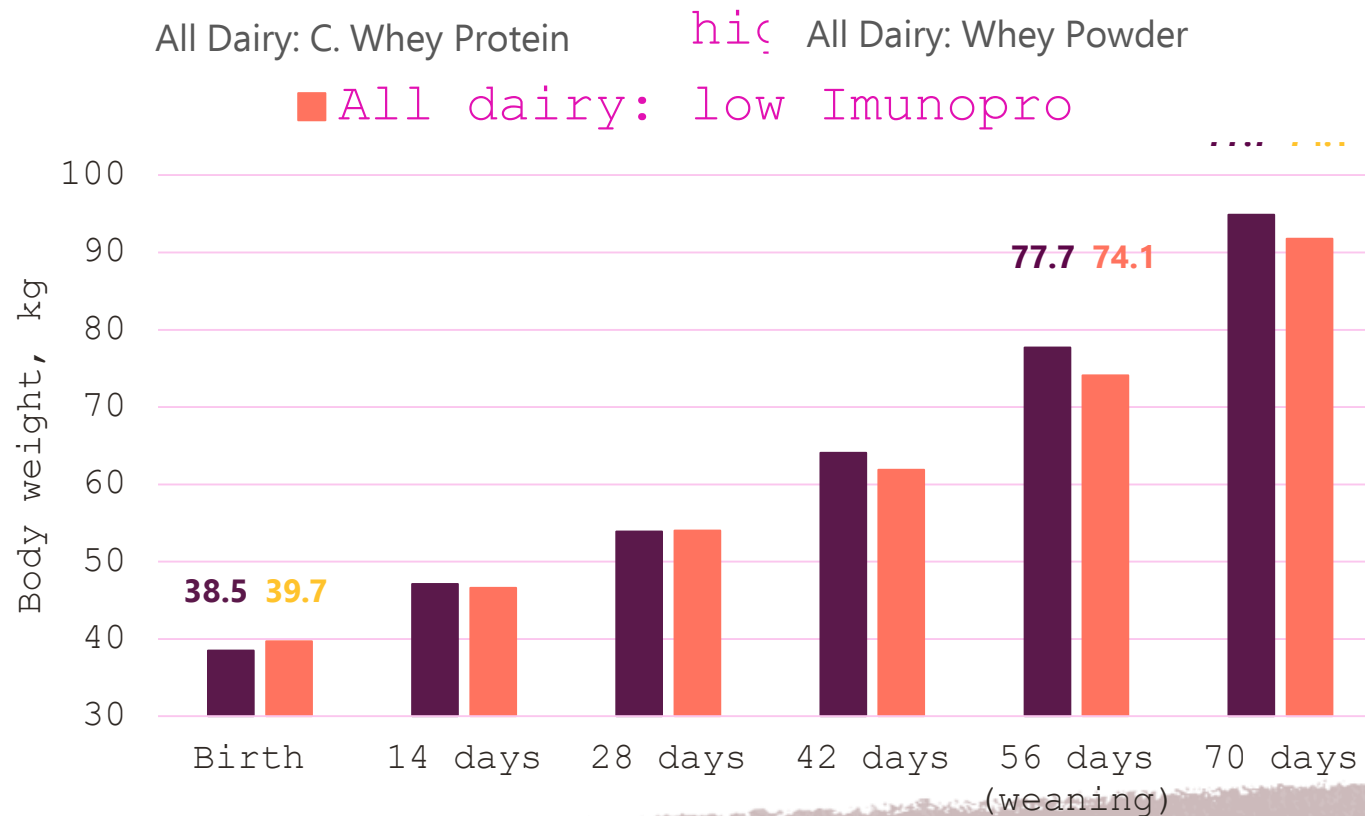
- support immune system
- influence growth & development

CONCENTRATED WHEY PROTEIN VS WHEY POWDER - GROWTH

Calves fed milk replacer based on **Whey Protein*** were **heavier at weaning** compared to those fed milk replacer with **Whey Powder** as the primary protein

Concentrated Whey Protein
 Whey Protein
 Vegetable Oil (palm & coconut)
 Calcium Carbonate
 Magnesium Oxide
 Gardion (garlic, dried) @225mg/kg

Whey Powder
 Whey Powder
 Whey Protein Powder
 Vegetable Oil (palm & coconut)
 Calcium Carbonate
 Magnesium Oxide
 Gardion (garlic, dried) @225mg/kg



MR (26% CP, 16% fat; mixed at 150g/L) offered at 5L/d (d5-10); 7L/d (d11-34); 5L/d (d35-49); 2L/d (d49-55). Ad libitum starter, chopped straw & water from birth.

*VMR's concentrated whey protein, Imunopro®. Data Source: VMR Calf Trial 2019/20 - AFBI, Hillsborough, NI

YOUR PARTNER FOR PERFORMANCE



WHEY PROTEIN VS WHEY POWDER – AGE AT CALVING

Calves fed milk replacer based on **Whey Protein*** were **younger at first calving** compared to those fed milk replacer with **Whey Powder** as the primary protein

Whey Protein
 Whey Protein
 Vegetable Oil (palm & coconut)
 Calcium Carbonate
 Magnesium Oxide
 Gardion (garlic, dried) @225mg/kg



Whey Powder
 Whey Powder
 Whey Protein Powder
 Vegetable Oil (palm & coconut)
 Calcium Carbonate
 Magnesium Oxide
 Gardion (garlic, dried) @225mg/kg



	Whey Protein	Whey Powder
No. heifers at first breeding	5	6
Services per conception	1.4	2.0
First service conception rate	3/5 (60%)	3/6 (50%)
Age at 1st calving, days	729	751
% calved by 24 months	4/5 (80%)	2/6 (33%)

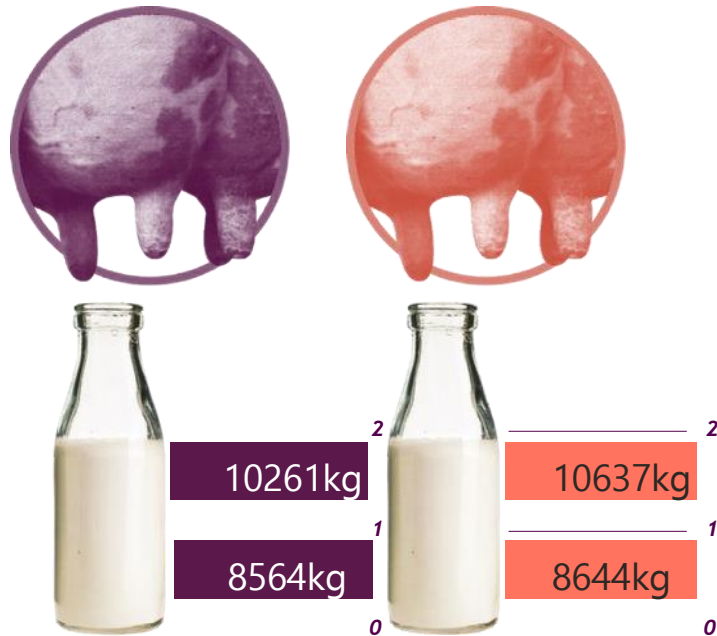
Increased rearing cost of **£63.14** per heifer #

*VMR's concentrated whey protein, Imunopro®. #based on an increase of £2.87/d for every day increase in AFC over 24 mo (AHDB Calf to Calving rearing costs). Data Source: VMR Calf Trial 2019/20 - AFBI, Hillsborough, NI



WHEY PROTEIN VS WHEY POWDER – MILK PRODUCTION

Milk per day of life up to 3rd calving was higher for heifers fed milk replacer with **Whey Protein*** as the major source of protein vs. those fed milk replacer with **Whey Powder** as the primary protein

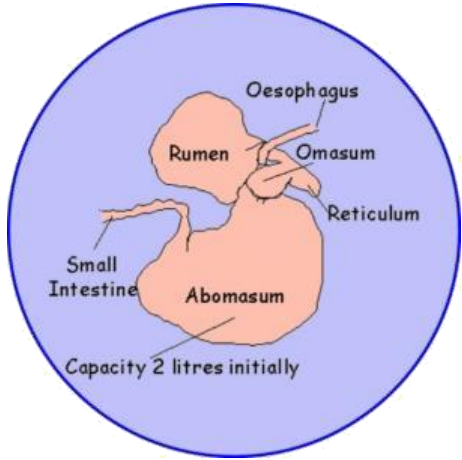


	Whey Protein	Whey Powder
No. calved for 3 rd time#	4/5 (80%)	5/6 (83%)
% of cows surviving 1.5 lactations	5/5 (100%)	5/6 (83%)
Total DIM (L1 & L2)	658	584
Total milk yield (L1 & L2), kg	18825	17508
Milk/d of life up to 3rd calving, kg*	12.6	12.1

*total yield over 2 lactations/(cull date or calving 3 date - birth date)

Difference of 1317kg over L1 & 2 = £593 per heifer
(based on milk price of 45ppl)

ROLE OF SOLID FEED IN RUMEN DEVELOPMENT



Water

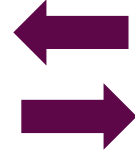


Population of rumen bacteria grows

Ingested solid feed (starter) in the rumen



Ruminal microbial fermentation



Production of short chain fatty acids, & microbial protein



Rumens development



Nutrients for maintenance & growth



BALANCING THE INTAKE OF MILK & STARTER FEED

Increasing Milk Intake:

- Maximise feed efficiency
- Maximise early **growth** potential
- Improve health

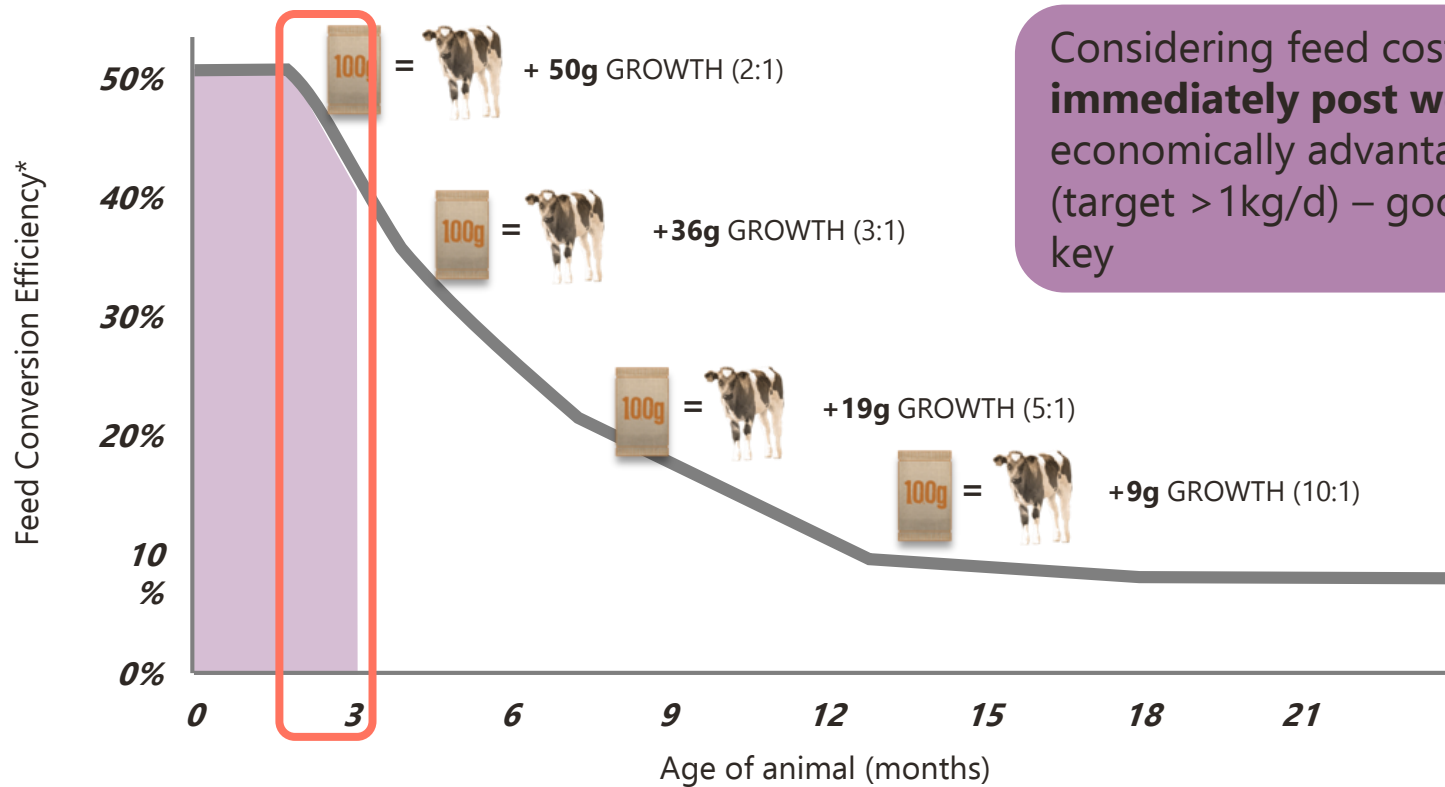


Increasing Solid Feed Intake:

- Improve nutrient supply & growth pre weaning
- Enhance **rumen development**
- Facilitate the weaning process & growth around weaning

FEED EFFICIENCY POST WEANING

Feed efficiency (the relative ability of the animal to turn feed nutrients into growth) is at its highest during the milk feeding period & immediately post weaning



Considering feed costs & feed efficiency, **immediately post weaning** is the most economically advantageous stage to grow heifers (target > 1kg/d) – good rumen development is key

*BW gain/amount of feed consumed. Bach & Ahedo 2008 Vet Clinics Food Animal Prac 24 117-38

BALANCING THE INTAKE OF MILK & STARTER FEED

Milk Feeding:

- Milk replacer with a **fat level of 16 to 20%** (>20% can suppress starter intake)¹
- Offer ~**900g milk solids/d** (high milk volumes suppress starter intake)²
- Reduce milk over a **3-wk period** prior to weaning³



Starter & Forage:

- Palatable, fresh starter & **water** from day 1
- **Chopped forage** (3-4cm, ad lib)³



Housing:

- **Social housing** (pair or group from day 7)⁴



¹Hill et al 2009 J D Sci 92:5147-5153; ²Bach et al 2013 J D Sci 96:7790-7797; ³Castells et al 2012 J D Sci 95:286-293; ⁴Jensen et al 2015 J D Sci 98:2568

BALANCING MILK AND STARTER INTAKE: CALF TRIALS

Colostrum Feeding



Milk Composition



Milk Volume

Weaning



Solid Feed and Water



Environmental Temperature



Housing

CALF TRIAL: MANAGEMENT

Milk Volume

7L per day from day 22
 Mixed at 15% = 1050g milk solids/d
 Total milk powder **50.4kg / calf**



23% CP, **17% fat**
 or
 23% CP, **25% Fat**

Skim Based



Weaning

Milk reduced gradually from day 42
 from 7 to 2 litres over 21 days
 Weaned on day 63

Period (days)	CMR (litres/d)	CMR (g/litre)	CMR (g/d)
3-21	4.5 to 6	150	675 to 900
22-42	7	150	1050
43-49	6	150	900
50-56	4	150	600
57-63	2 (once daily)	150	300



Solid Feed and Water

Water & mixture of calf starter & chopped straw



Housing

Group housed (3 to 6 calves per pen), fed via buckets twice daily

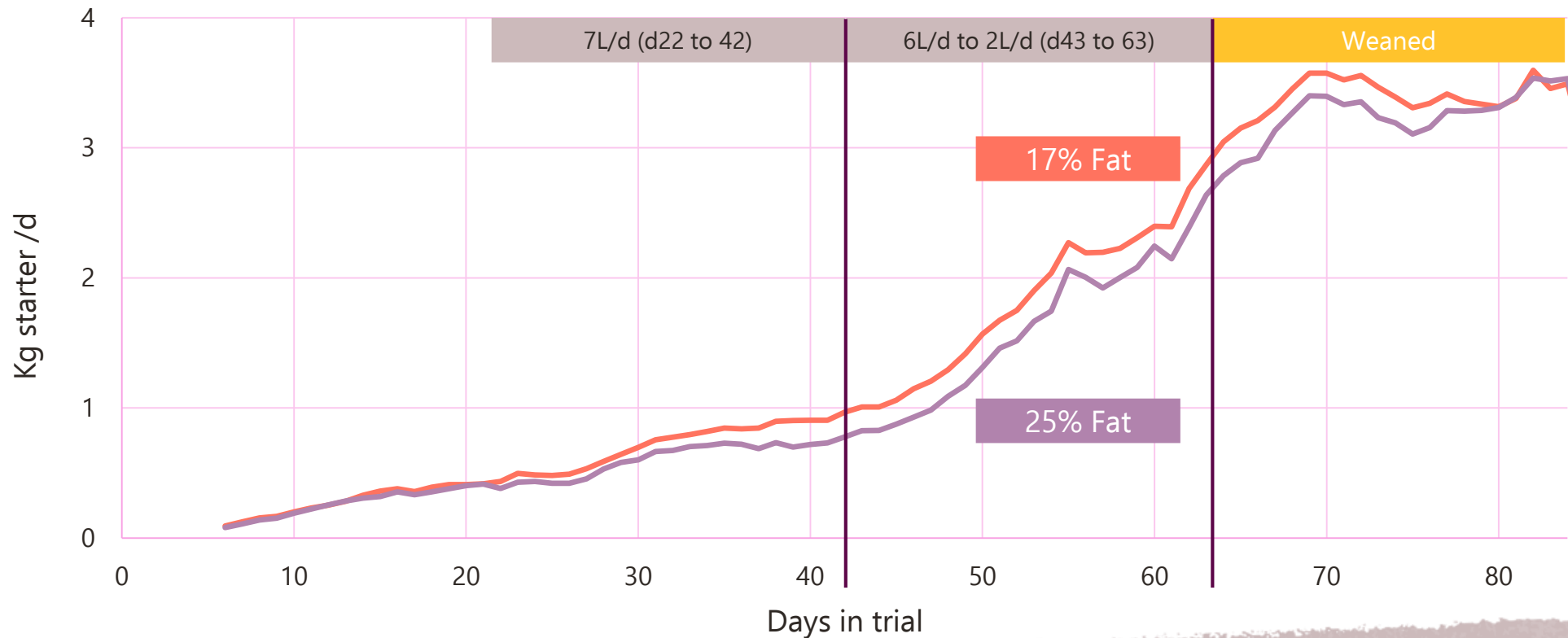


HOW MUCH STARTER ARE CALVES EATING?



Calves fed **17% fat** milk replacer consumed:

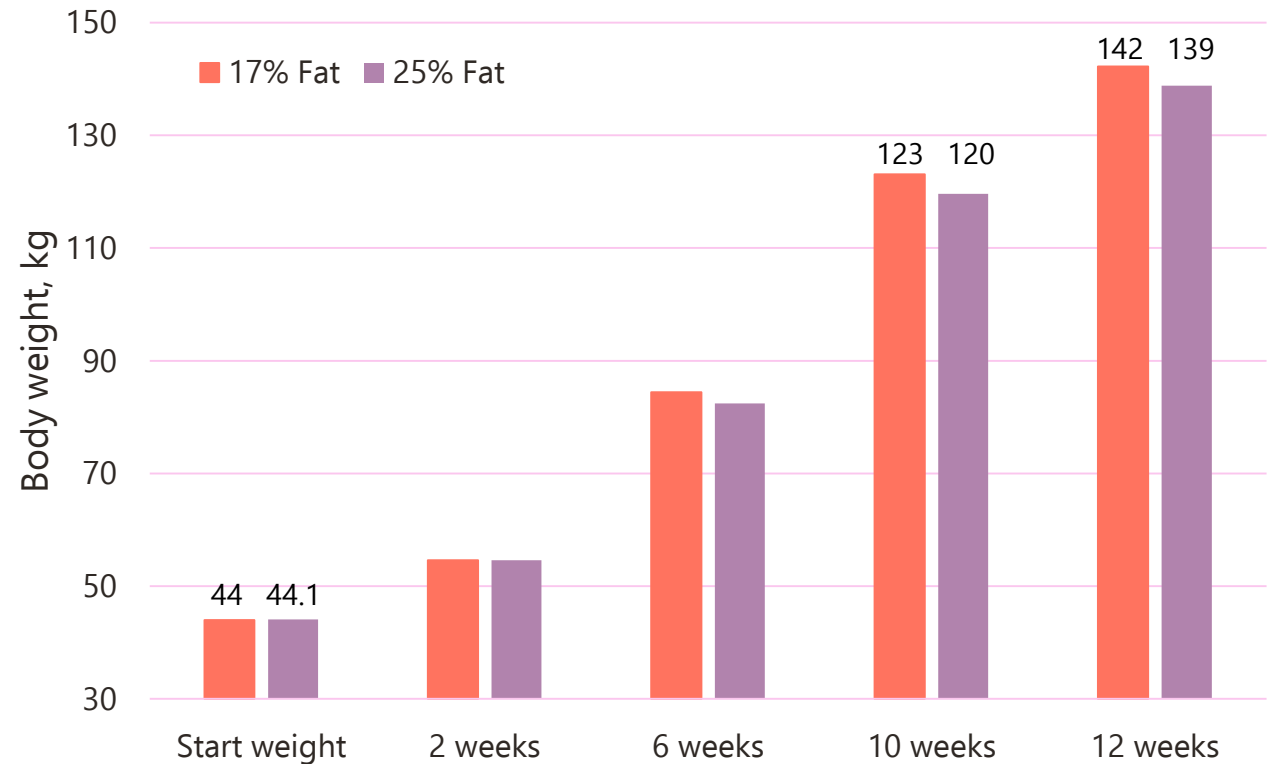
- **10.4kg extra concentrate** over 12 weeks
- Total of **15kg of NFC** (non-fibre carbohydrate) from starter **3 days earlier***



WHAT IS THE TOTAL ENERGY INTAKE FROM MILK & STARTER?

	CP 23, Fat 17	CP 23, Fat 25
Total Intake, kg of DM		
Milk Replacer	50.4	50.4
Starter (roughage)	90 (10)	80.6 (8.9)
ME Intake, Mcal		
Milk Replacer	232.6	243.1
Starter & Roughage	227.0	204.7
Total	459.6	447.8
ADG to 10 wks, g/d	1114.5	1063.9

*17% fat, 4616kcal; 25% fat 4824 kcal



CALF TRIAL: MANAGEMENT

Colostrum Feeding

4L pooled colostrum (>22% Brix) tubed within 4 to 6 hours of birth
Colostrum/whole milk (2nd & 3rd milking) ad lib for 1st 72 hours



Flourish Calf

23% CP, **19% Fat**
50% Skim

50g CP per Mcal energy

Milk Volume

7L per day from day 10
Mixed at 15% = 1050g milk solids/d
Total milk powder: **57.1kg / calf**



Weaning

Milk reduced gradually from day 46 from 7 to 2 litres over 21 days
Weaned on day 66

Age period (days)	Days	CMR (g/litre)	CMR (litres/d)	CMR (g/d)
4-10	7	150	5 to 7	750 to 1050
11-45	35	150	7	1050
46-66	21	150	7 to 2	1050 to 300



Solid Feed and Water

Water - 1 water trough per pen
Calf starter pellets - calf nuts, 17% CP
Straw in racks



Environmental Temperature

Straw bales used to provide shelter



Housing

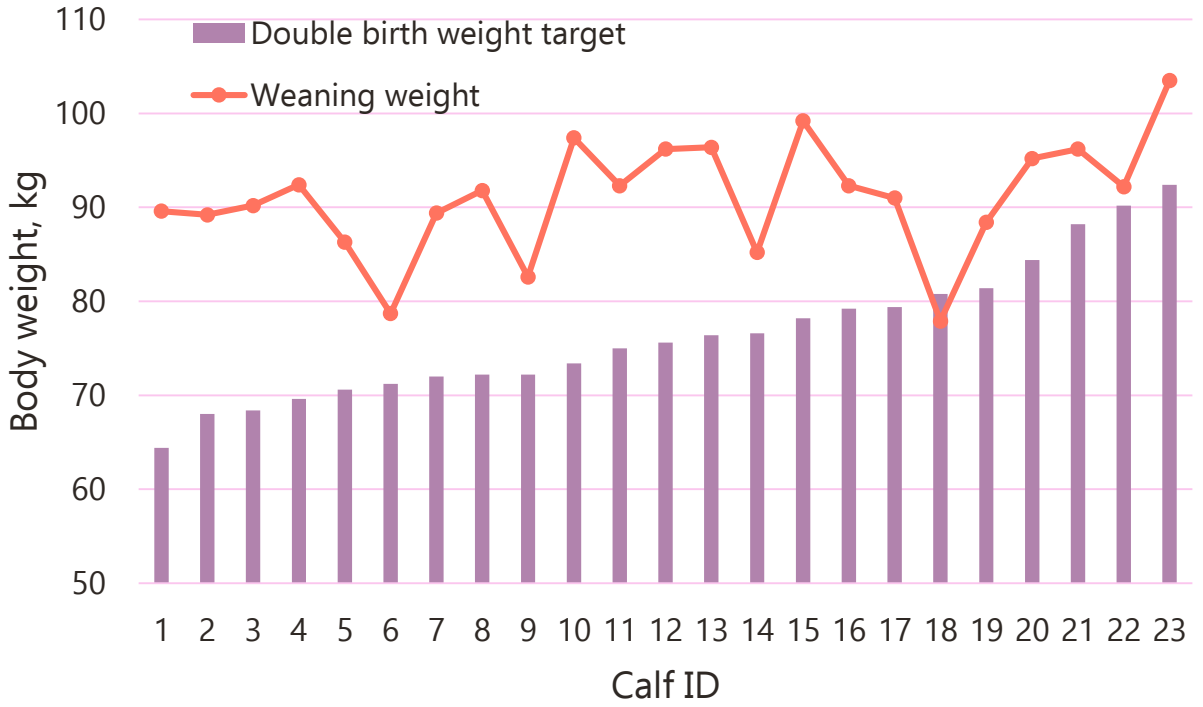
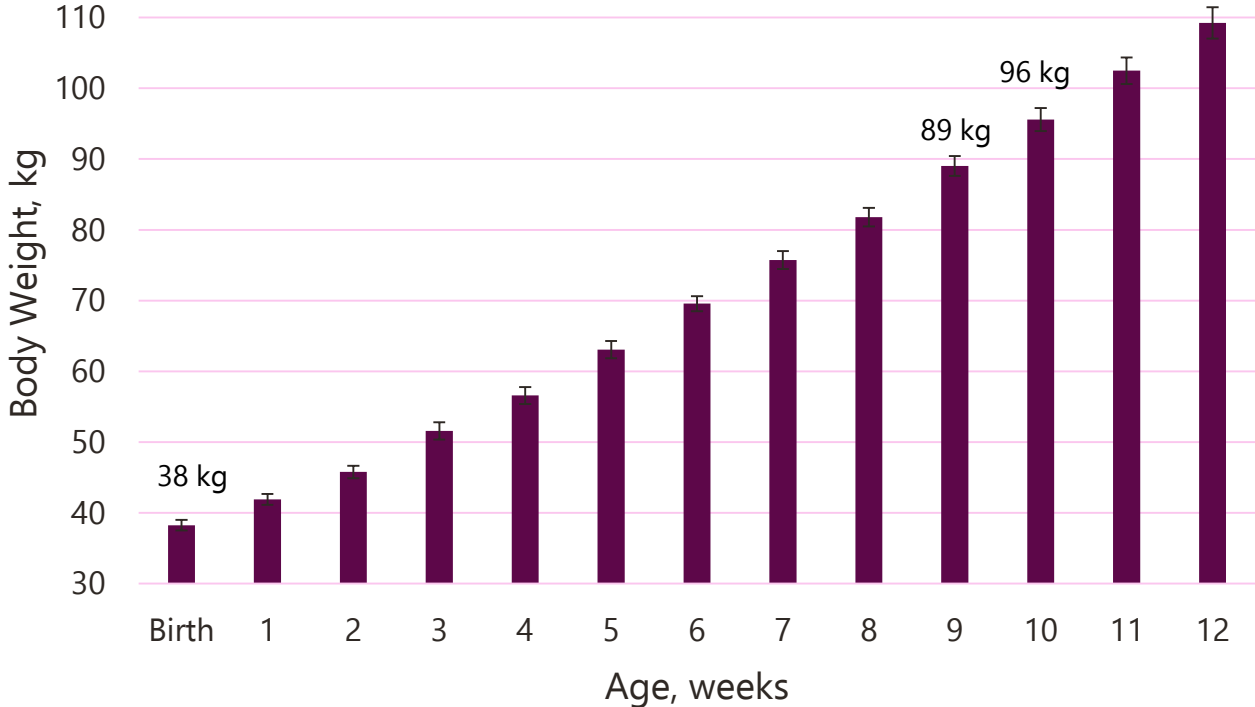
Group housed, fed via computerised feeder

ARE INDIVIDUAL CALVES DOUBLING THEIR BIRTH WEIGHT BY WEANING?

Double birth weight at weaning

Body weight at weaning: **91kg** (range 78 to 104kg)

Only 1 calf failed to double its birth weight by weaning

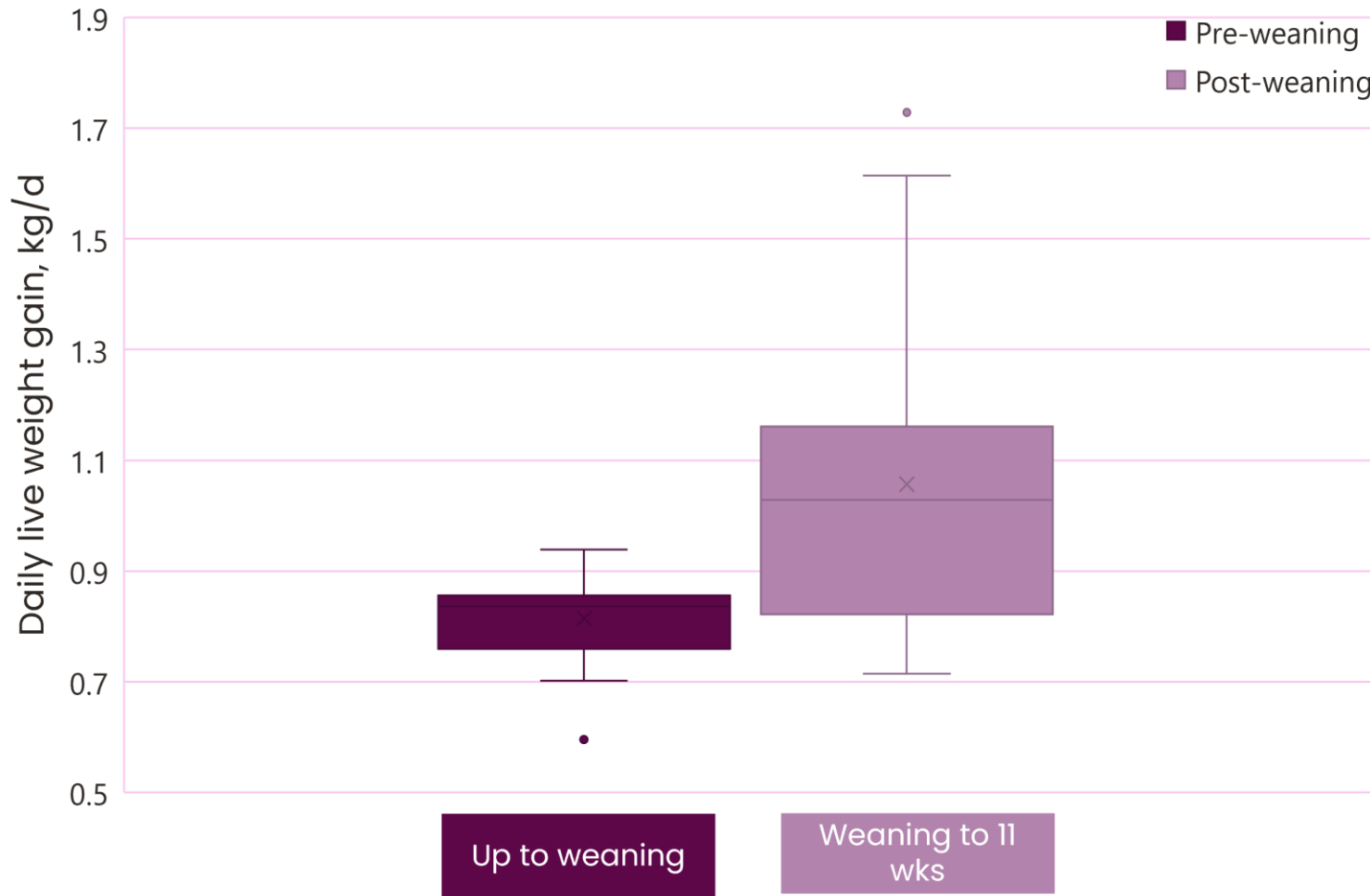




ARE CALVES GROWING WELL IMMEDIATELY POST WEANING?



Post weaning DLWG >1kg/d



Daily live weight gain weaning (d66) to 11 weeks: **1.1 kg/d** (range 0.7 to 1.7 kg/d)



YOUR PARTNER FOR PERFORMANCE



VMR CALF TRIAL: MANAGEMENT

Colostrum Feeding

3.5L dam's colostrum via teated bottle or tube within 2 hours of birth
 2 x 2.5L colostrum daily up to 3 days of age & 2 x 2.5L half colostrum/half MR on day 4



23% CP, 18% Fat
 Whey Protein

48g CP per Mcal energy



Milk Volume

7L per day from day 8
 Mixed at 15% = 1050g milk solids/d
 Total milk powder **50kg / calf**

Weaning

Milk reduced gradually from day 43 from 7 to 2.5 litres over 21 days
 Weaned on day 63

Age period (days)	CMR (litres/d)	CMR (g/litre)	CMR (g/d)
5-7	5	150	750
8-42	7	150	1050
43-56	5	150	750
57-63	2.5 (once daily)	150	375



Solid Feed and Water

Water, calf starter pellets (CP 18%) & chopped straw in separate buckets



Environmental Temperature

Calf jackets for first 28 days



Housing

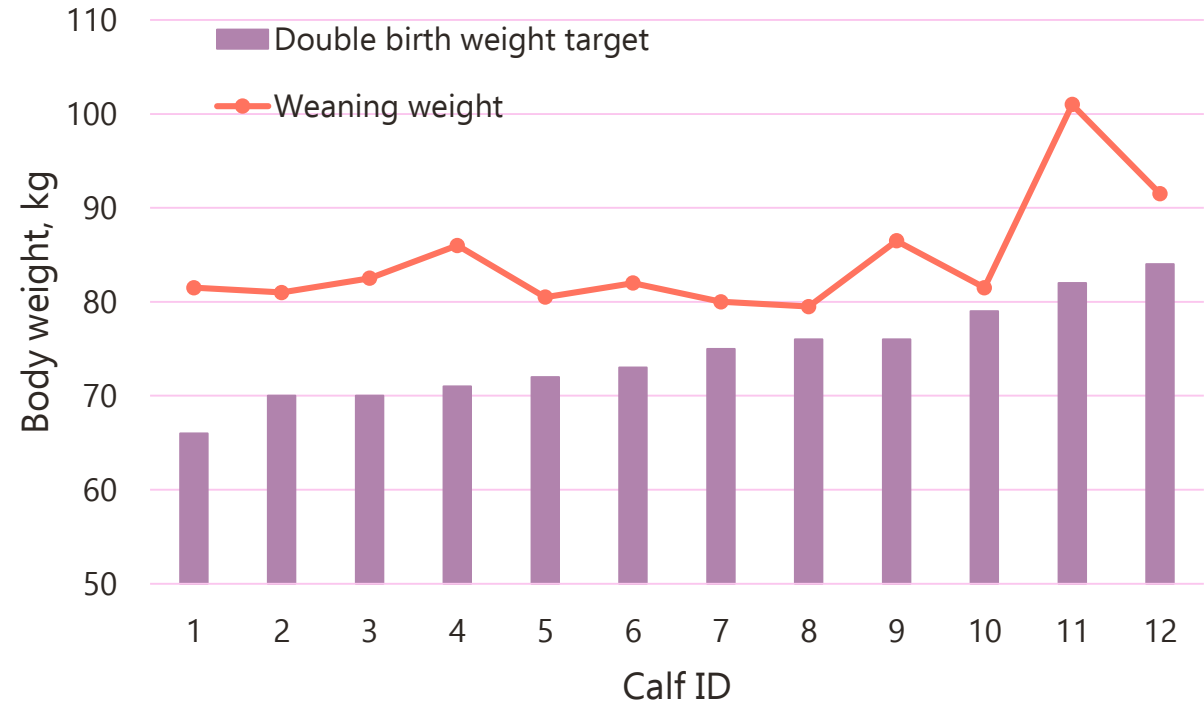
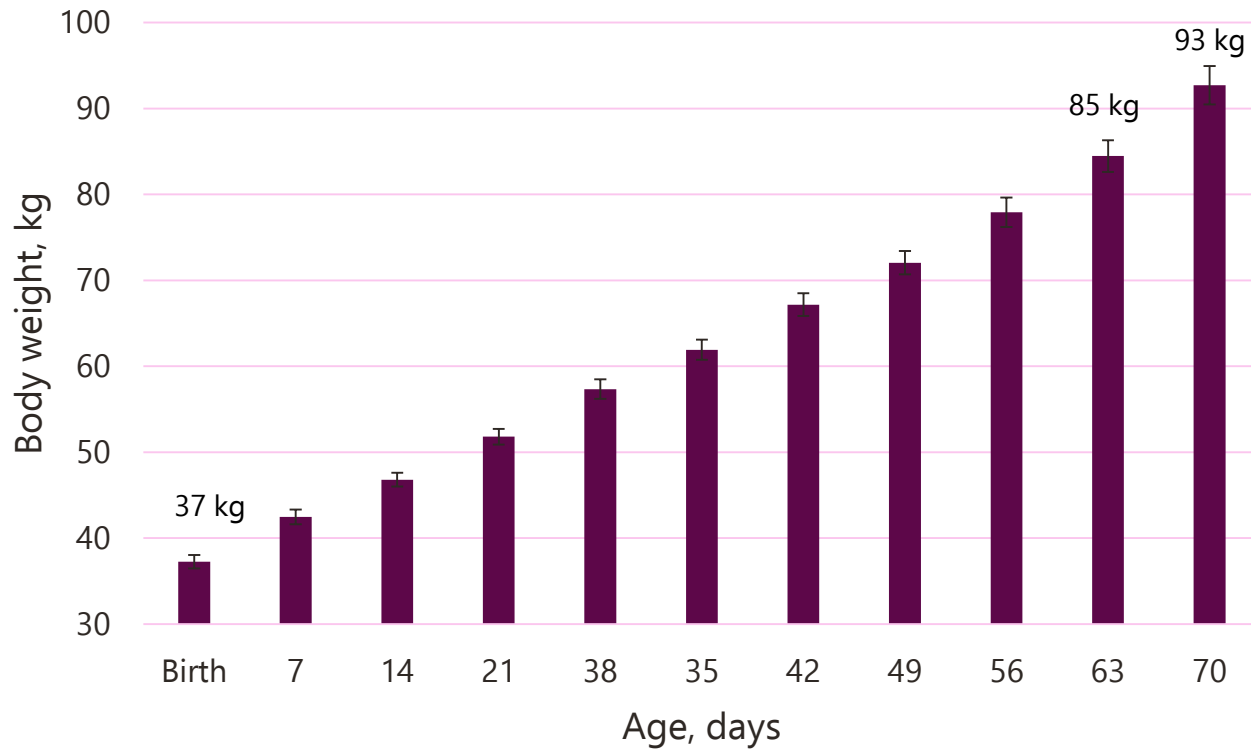
Pair housed, fed via teated buckets twice daily

ARE INDIVIDUAL CALVES DOUBLING THEIR BIRTH WEIGHT BY WEANING?

Double birth weight at weaning

Body weight at weaning: **85kg** (range 80 to 101kg)

All calves doubled their birth weight by weaning

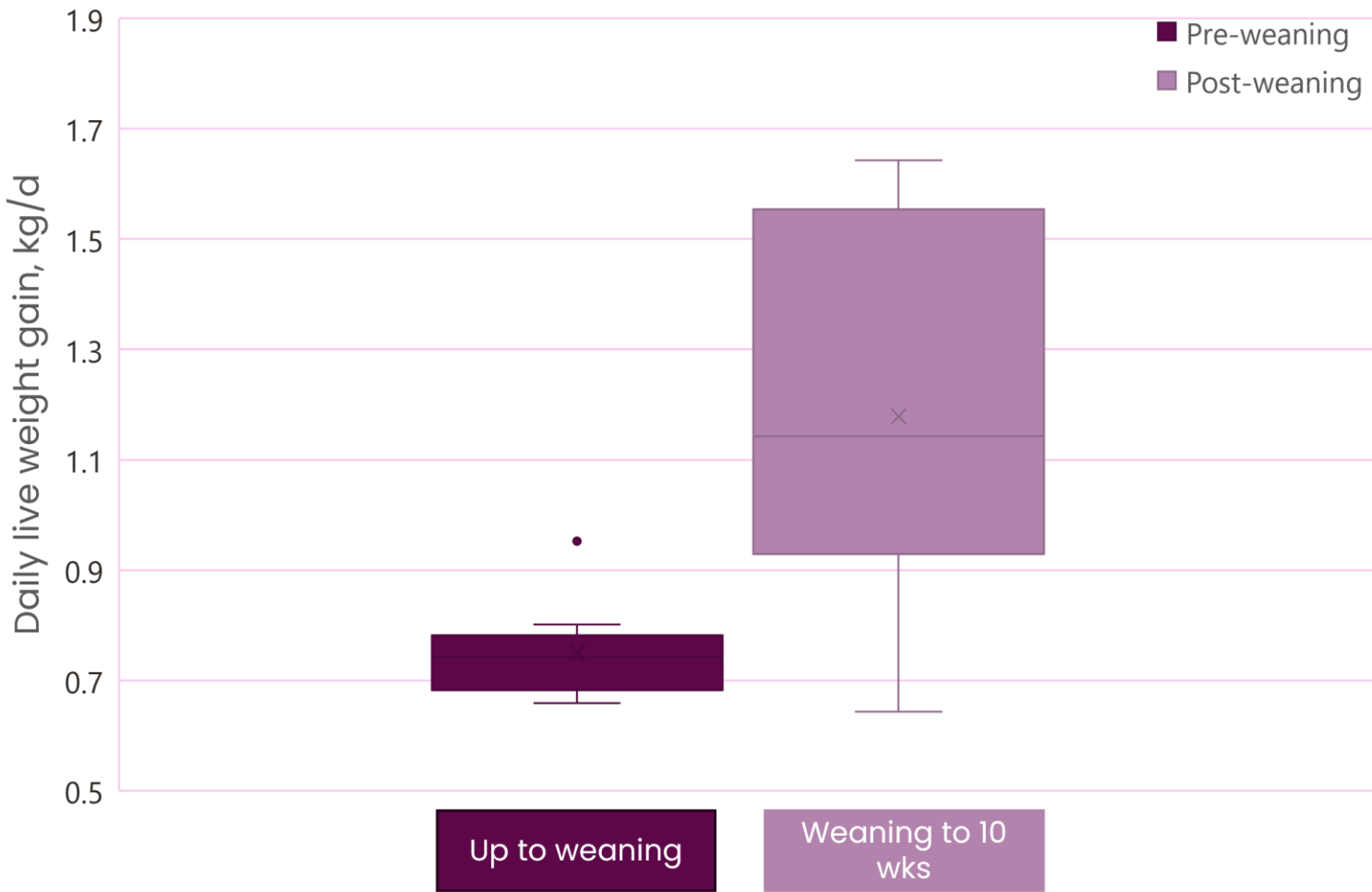


YOUR PARTNER FOR PERFORMANCE



ARE CALVES GROWING WELL IMMEDIATELY POST WEANING?

Post weaning DLWG > 1kg/d

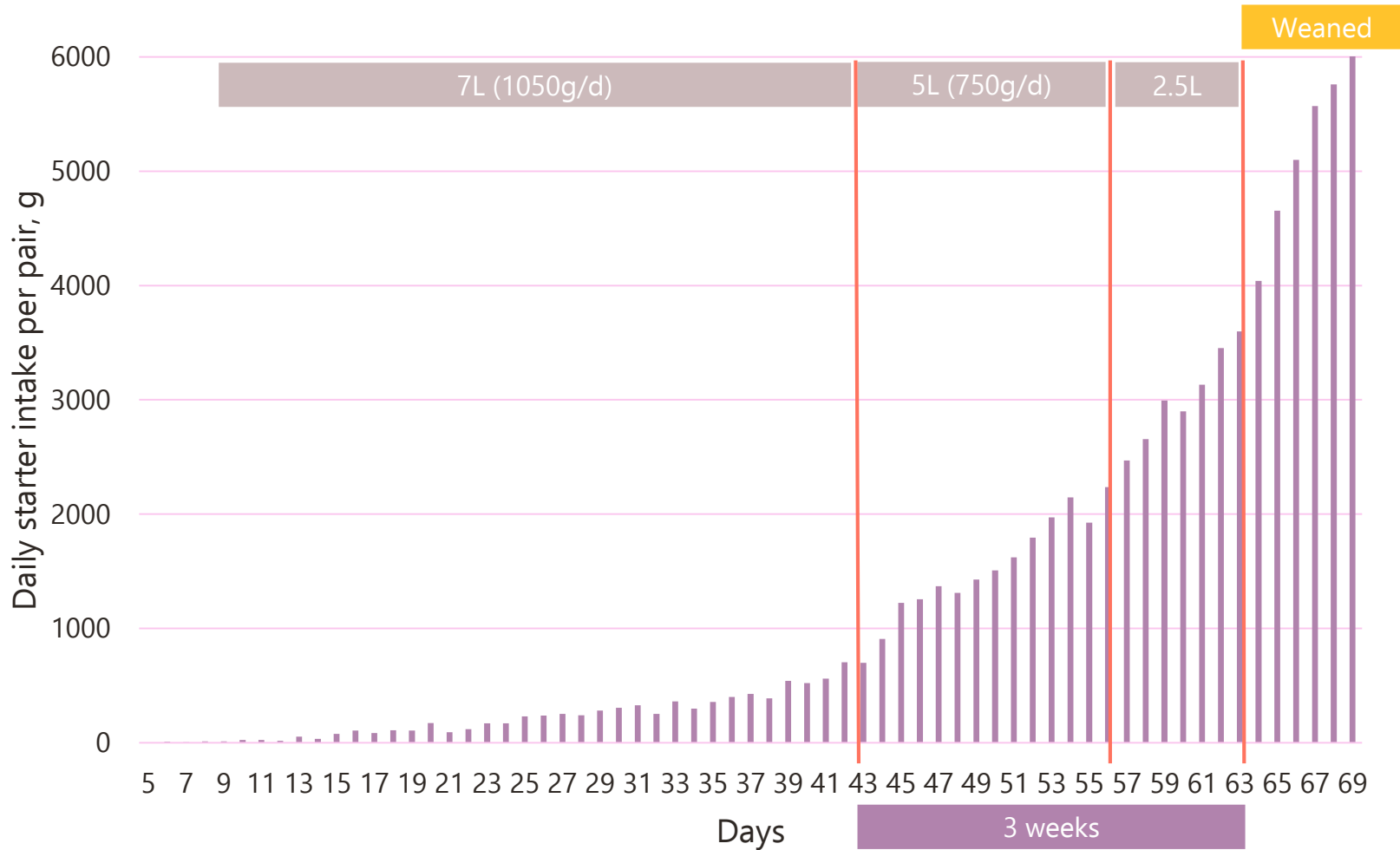


Daily live weight gain weaning (d63) to 10 weeks: **1.2 kg/d** (range 0.6 to 1.6 kg/d)



HOW MUCH STARTER ARE CALVES EATING?

Good starter intake



Starter intake was minimal until milk was reduced on day 42

Average starter intake at weaning (d63): **1.8kg/d**



SUMMARY

- ➔ Calve heifers at **24 months of age** = better fertility, more milk, best survival, €
- ➔ Heifers must be **85 to 90% mature body weight** at 1st calving

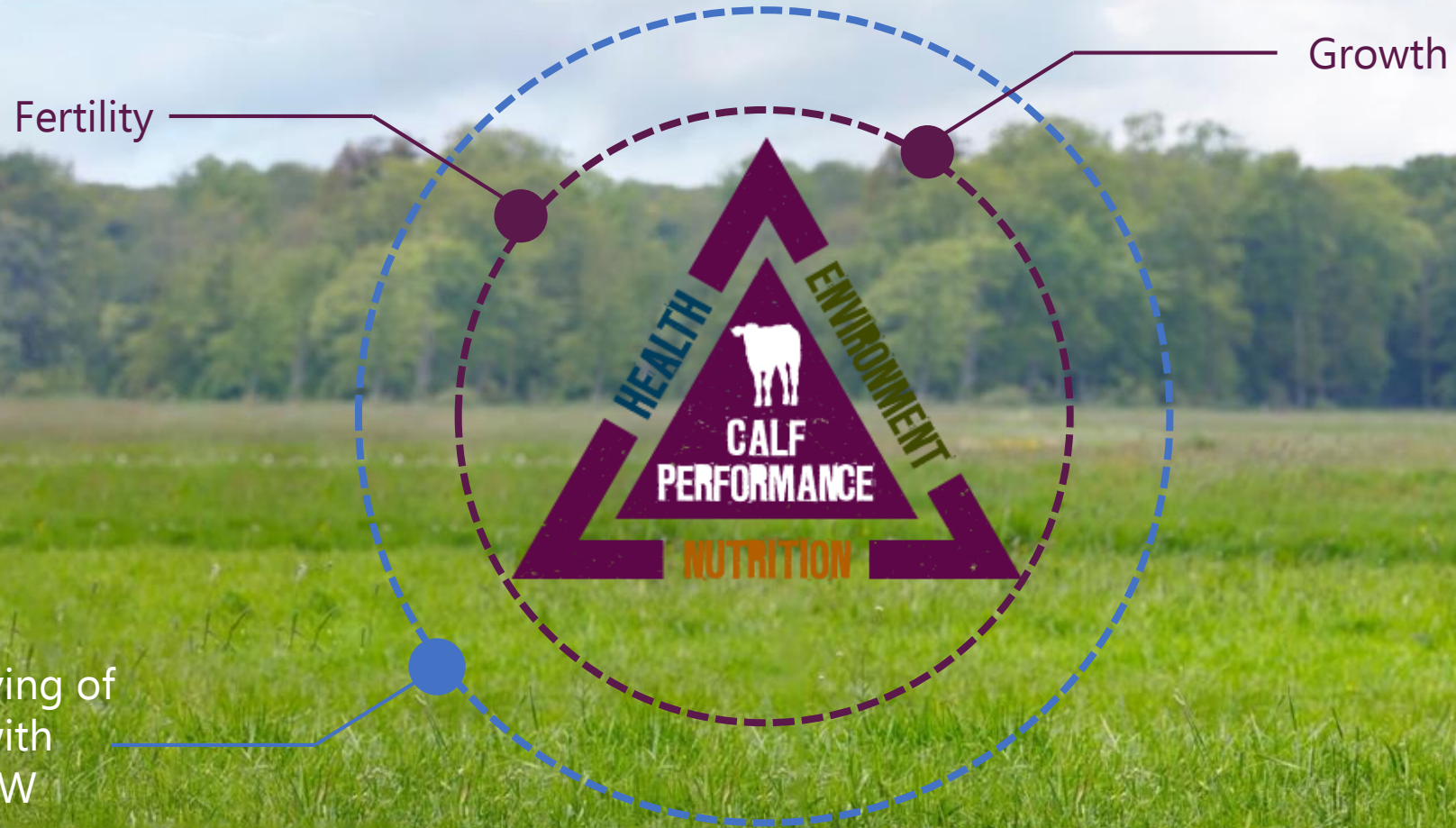
- ➔ **Double birth weight** by weaning at 63 days
- ➔ Pre weaning daily live weight gain ≥ 0.7 kg per day
- ➔ **Smooth weaning transition** – no setbacks in growth
- ➔ Post weaning daily live weight gain > 1 kg per day

- ➔ Feed a good quality milk replacer, based on concentrated whey protein or skim
- ➔ Use a milk replacer with a fat level of **16 to 20% fat**
- ➔ Offer at least **900g milk solids per day** (6 litres at 150g/L)
- ➔ Reach the maximum milk allowance by **day 14**
- ➔ Ensure good intakes of **starter feed for 3 weeks before weaning**
- ➔ Gradually **wean over 21 days**: reduce milk from day 42 to 63 – **wean on day 63**





STARTING STRONG IS THE KEY TO FINISHING STRONGER





STARTING STRONG IS THE KEY TO FINISHING STRONGER

Shorter Non-Productive Period

Improved Survival

Better Fertility

Better Udder Health

Higher Milk Production

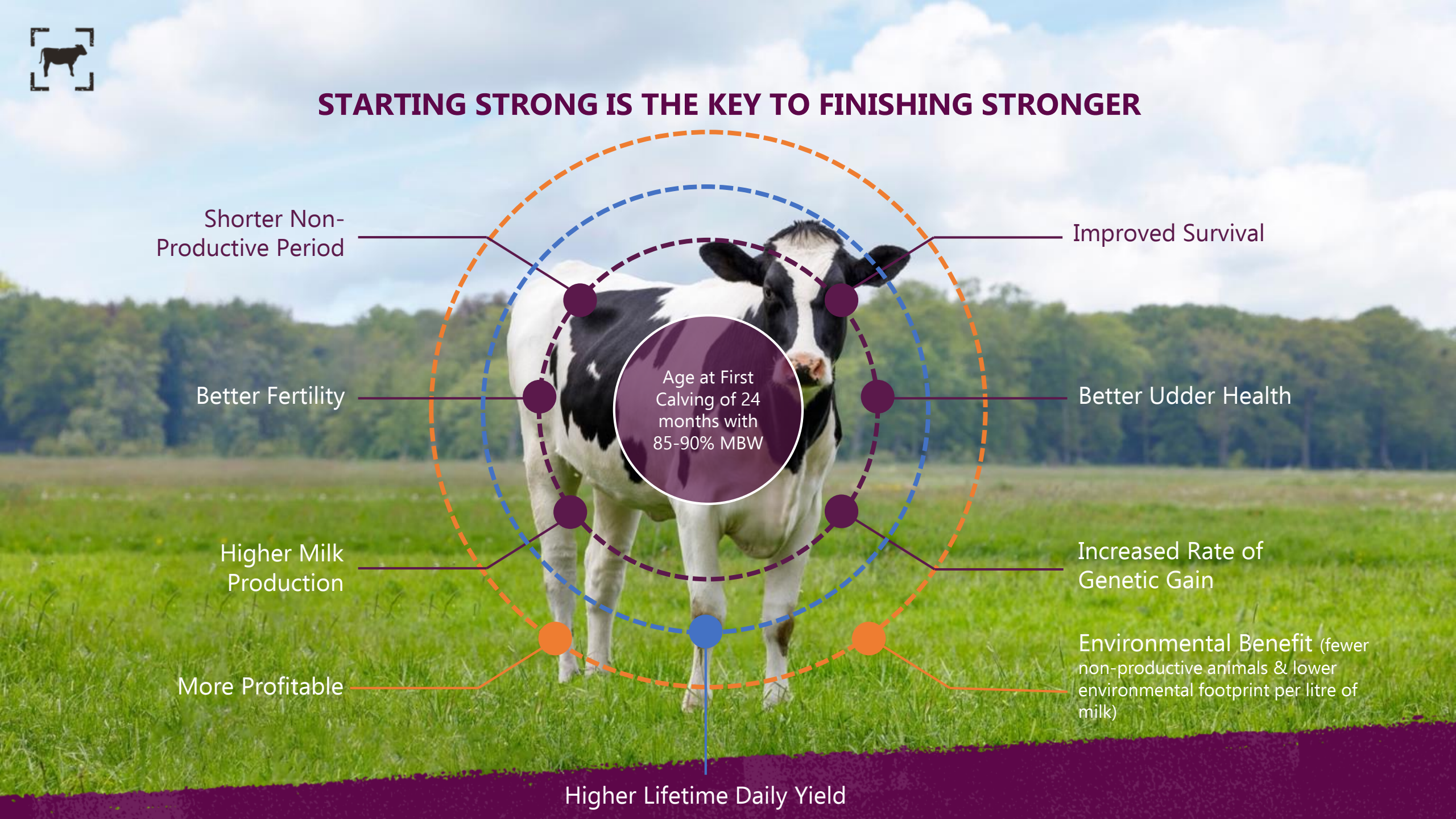
Increased Rate of Genetic Gain

More Profitable

Environmental Benefit (fewer non-productive animals & lower environmental footprint per litre of milk)

Higher Lifetime Daily Yield

Age at First Calving of 24 months with 85-90% MBW





THANK YOU



For more information on calf rearing,
Calf Milk Replacer, and the latest
technical news please visit
www.feedforgrowth.com