



## Imunogard Calf Trial

### Objective

To compare the performance of heifer calves fed Imunogard milk replacer at either 7L (1050g milk solids) per day or 9L (1350g milk solids) per day.

|                         |                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------|
| <b>Trial Site</b>       | <b>Duchy College (Cornwall, England)</b>                                                             |
| <b>Calf type</b>        | Holstein heifers                                                                                     |
| <b>Number of Calves</b> | 25 (born Sept to Oct 25)                                                                             |
| <b>Milk Powder</b>      | Imunogard (23% crude protein, 21% fat; 100% dairy protein; contains Celmanax™, Butyrate and Gardion) |
| <b>Feeder Type</b>      | Forster Technik Computerised Feeder                                                                  |

### Management and Feed

#### Colostrum:

- Calves were fed with 4L pooled colostrum (>22% Brix) within 4 to 6 hours of birth and then group housed (n=10 calves/pen) for 72 hours and fed colostrum / whole milk (2nd and 3rd milking) via an ad lib drum (~4L milk per feed).

#### Milk Replacer:

- On day 4, calves were introduced to a computerised feeder (with 2 feed stations) and fed milk replacer mixed at 150g/L (150g powder + 850ml water = 1L of mixed milk) with a peak milk allowance of either 7L (1050g milk solids) or 9L (1350g milk solids) per day.

#### Water and Dry Feed:

- Fresh water, calf starter pellets 17% CP and straw in racks was available ad-libitum from day 4

#### Weaning:

- Calves fed 7L (1050g milk solids) were weaned over 21 days with milk reduced from 7 to 2L from day 46 to 66 (weaned at 66 days of age)
- Calves fed 9L (1350g milk solids) were weaned over 28 days with milk reduced from 9 to 2L from day 53 to 80 (weaned at 80 days of age)



## Results

### Calf performance

- All calves doubled their birth weight by weaning: calves fed 7L (1050g milk solids) weighed on average 87kg (day 66) and those fed 9L (1350g milk solids) weighed 101kg (day 80).
- Calves fed 9L (1350g milk solids) had an early growth advantage reflecting the higher milk solids – they were heavier from week 4 to 11 and had a higher daily live weight gain (DLWG) from week 2 to 6 compared to those fed 7L (1050g milk solids).
- Calves fed 9L (1350g milk solids) suffered a setback in growth at the start of the weaning transition likely reflecting a lower starter intake due to the higher milk volume – they had a lower DLWG from week 8 to 12 compared to those fed 7L (1050g milk solids).
- Overall, body weight at 12 weeks, and DLWG from birth to 12 weeks was the same across both feed plans (104kg and 0.78kg per day)

**Table 1. Milk Feeding Plan: 7L (1050g milk solids) per day over 63 days**

| Age period (days) | Days | CMR (litres/d)                                            | CMR (g/d)   |
|-------------------|------|-----------------------------------------------------------|-------------|
| 1 to 3            | 3    | 4L colostrum, followed by ad lib colostrum/<br>whole milk |             |
| 4 to 10           | 7    | 5 to 7                                                    | 750 to 1050 |
| 11 to 45          | 35   | 7                                                         | 1050        |
| 46 to 66          | 21   | 7 to 2                                                    | 1050 to 300 |

Total days on feeder, 63d; Total milk powder, 57kg

**Table 2. Milk Feeding Plan: 9L (1350g milk solids) per day over 77 days**

| Age period (days) | Days | CMR (litres/d)                                            | CMR (g/d)    |
|-------------------|------|-----------------------------------------------------------|--------------|
| 1 to 3            | 3    | 4L colostrum, followed by ad lib colostrum/<br>whole milk |              |
| 4 to 10           | 7    | 5 to 7                                                    | 750 to 1050  |
| 11 to 17          | 7    | 7 to 9                                                    | 1050 to 1350 |
| 18 to 52          | 35   | 9                                                         | 1350         |
| 53 to 59          | 7    | 9 to 7                                                    | 1350 to 1050 |
| 60 to 80          | 21   | 7 to 2                                                    | 1050 to 300  |

Total days on feeder, 77d; Total milk powder, 84kg



Table 3. Body weight (kg) up to 12 weeks for calves fed either 7L (1050g) or 9L (1350g) per day

|         | 7L (1050g) per day, n=12 |          | 9L (1350g) per day, n=13 |          |
|---------|--------------------------|----------|--------------------------|----------|
|         | Mean $\pm$ SEM           | Range    | Mean $\pm$ SEM           | Range    |
| Birth   | 39.7 $\pm$ 0.8           | 35 – 43  | 40.4 $\pm$ 1.2           | 34 – 49  |
| Week 1  | 42.4 $\pm$ 0.6           | 39 – 45  | 42.5 $\pm$ 1.1           | 36 – 50  |
| Week 2  | 46.1 $\pm$ 1.4           | 35 – 52  | 45.7 $\pm$ 1.2           | 38 – 53  |
| Week 3  | 51.6 $\pm$ 1.1           | 43 – 57  | 51.6 $\pm$ 1.2           | 45 – 58  |
| Week 4  | 56.1 $\pm$ 1.0           | 51 – 61  | 57.0 $\pm$ 1.4           | 50 – 64  |
| Week 5  | 62.3 $\pm$ 1.0           | 55 – 67  | 64.0 $\pm$ 1.4           | 55 – 71  |
| Week 6  | 66.6 $\pm$ 1.3           | 59 – 73  | 70.1 $\pm$ 1.8           | 59 – 79  |
| Week 7  | 72.9 $\pm$ 1.2           | 66 – 81  | 76.9 $\pm$ 1.9           | 66 – 87  |
| Week 8  | 79.3 $\pm$ 1.4           | 71 – 88  | 82.7 $\pm$ 2.2           | 72 – 94  |
| Week 9  | 85.5 $\pm$ 1.4           | 79 – 94  | 87.7 $\pm$ 2.3           | 77 – 102 |
| Week 10 | 91.1 $\pm$ 1.3           | 86 – 100 | 92.6 $\pm$ 2.0           | 82 – 105 |
| Week 11 | 97.7 $\pm$ 1.7 (n=11)    | 91 – 109 | 98.7 $\pm$ 2.1           | 88 – 110 |
| Week 12 | 104.6 $\pm$ 1.6 (n=10)   | 96 – 113 | 104.3 $\pm$ 2.0          | 94 – 115 |

Milk reduced over 21 days from d46 and weaned d66 (7L, 1050g milk solids) and milk reduced over 28d from d53 and weaned d80 (9L, 1350g milk solids).

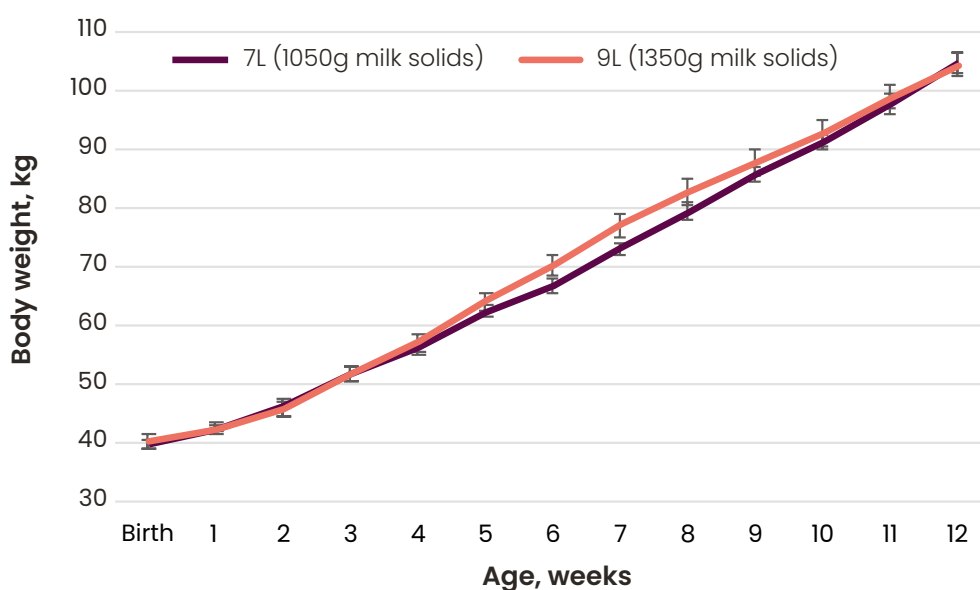
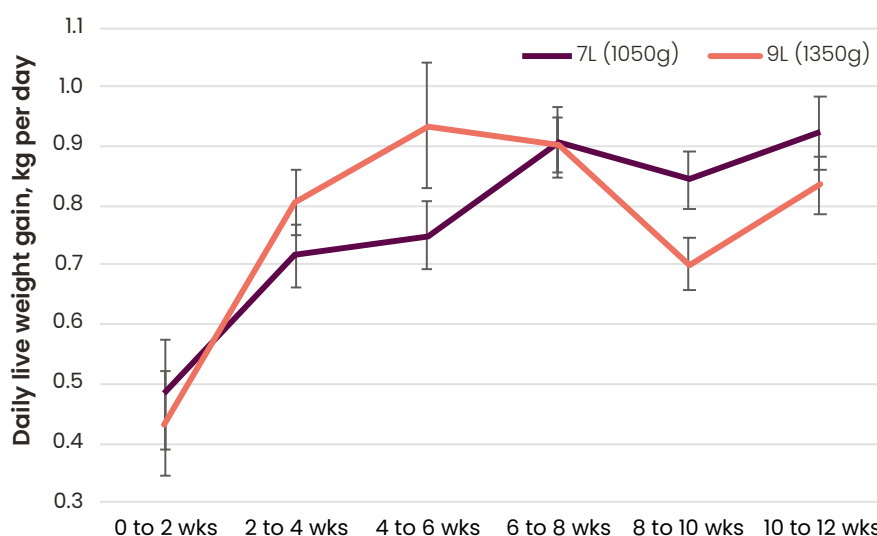
Figure 1. Body weight ( $\pm$ SEM) up to 12 weeks for calves fed 7L (1050g) and 9L (1350g) per day



Table 4. Body weight and daily live weight gain up to weaning and post weaning

|                              | 7L (1050g) per day, n=12 |             | 9L (1350g) per day, n=13 |             |
|------------------------------|--------------------------|-------------|--------------------------|-------------|
|                              | Mean $\pm$ SEM           | Range       | Mean $\pm$ SE            | Range       |
| Birth weight, kg             | 39.7 $\pm$ 0.8           | 35 – 43     | 40.4 $\pm$ 1.2           | 34 – 49     |
| Age at weaning, days         | 66                       |             | 80                       |             |
| Body weight at weaning, kg   | 86.7 $\pm$ 1.4           | 79 – 94     | 101.1 $\pm$ 2.5          | 88 – 115    |
| DLWG birth to weaning, kg/d  | 0.74 $\pm$ 0.02          | 0.64 – 0.86 | 0.78 $\pm$ 0.02          | 0.69 – 0.91 |
| DLWG 7d to weaning, kg/d     | 0.78 $\pm$ 0.02          | 0.67 – 0.90 | 0.80 $\pm$ 0.02          | 0.73 – 0.92 |
| DLWG birth to 12 weeks, kg/d | 0.78 $\pm$ 0.02          | 0.7–0.9     | 0.78 $\pm$ 0.02          | 0.7–0.9     |

Figure 2. Daily live weight gain ( $\pm$ SEM) up to 12 weeks for calves fed 7L (1050g) and 9L (1350g) per day

### Calf Health

- Calf health was good across both treatments; most calves received a faecal, nasal and eye score of 1 (normal) up to 12 weeks.
- Faecal score was comparable between the two treatments: only 1 calf in each feed plan (7L at week 4 and 9L at week 3) had a score of 2 (loose), no calf received a score of 3 (watery) at any point.

### Conclusions

- Calves fed more milk (9L, 1350g milk solids) had a better growth rate initially, but their growth suffered throughout the weaning transition compared to those fed 7L (1050g milk solids). Calves fed 7L (1050g milk solids) ate more starter and likely had better developed rumens around weaning, enabling them to better utilise the nutrients in the starter and continue to grow throughout the weaning transition.
- Overall, DLWG and health from birth to 12 weeks was the same across both feed plans (0.78 kg/d) with both groups of calves weighing on average 104 kg at 12 weeks. Therefore, the early growth advantage of feeding more milk powder (84kg vs. 57 kg milk powder) was not maintained.