

TURN TRANSITION COWS INTO  
**CASH COWS**



**CRITICALC RESEARCH REPORT**

# Product Information

## Product Benefits

*CritiCalc has been proven to get cows off to a better start to lactation by; reducing instances of post-partum metabolic diseases, improving early lactation energy status and increasing milk yields. Through numerous peer-reviewed published research trials, CritiCalc has proven itself to be a valuable management tool in order to prime transition cows to get off to a better and more profitable start to lactation.*

## Product Description

CritiCalc is a complimentary dietetic mineral feed (Calcium Supplement) for the reduction of the risk of Milk Fever (Hypocalcaemia) in dairy cows.

## Product Form

CritiCalc is available in three different formats; bolus, liquid drench and also as a powder mix.

## Product Features

- 65g of Calcium—50% more than other Calcium boluses
- Min. 4g of Rumen Soluble Magnesium
- Rumen Protected Selenium and Vitamin E
- Proven Research

## Product Offering:

|                 | <b>Bolus</b>                 | <b>Drench</b>               | <b>Powder</b>                  |
|-----------------|------------------------------|-----------------------------|--------------------------------|
| Inner           | 4 bolus box                  | 1 x 500ml Bottle            | 1 x 500g Foil Pouch            |
| Outer           | Bucket with 6 x 4 pack boxes | Box with 12 x 500ml Bottles | Bucket with 10 x 500ml Pouches |
| Pallet Quantity | 100 Buckets (2,400 Boluses)  | 30 Boxes (360 Bottles)      | 60 Buckets (600 pouches)       |



# Research Report

*The main objective of the CritiCalc supplement is to get the cow off to the best possible start in lactation, it was formulated not only to boost calcium status in freshly calved cows but also to aid immune function and energy status.*

## Our results show that cows given 2 CritiCalc boluses at calving:

- Have fewer cases of Clinical Milk Fever
- Have fewer post-partum metabolic issues
- Maintain better energy status in early lactation
- Produce more milk



This report collates the results of 4 different research trials carried out with the CritiCalc bolus from 2018—2020. The main areas of research focus during this time were on evaluating and quantifying the performance in these key critical areas; post-partum metabolic disease levels, early lactation energy status and milk production performance.

## Research Trial Details

| Research Trial                  | A                | B                | C                | D                | Total |
|---------------------------------|------------------|------------------|------------------|------------------|-------|
| n—Control                       | 51               | 30               | 22               | 32               | 135   |
| n—CritiCalc                     | 52               | 31               | 16               | 29               | 128   |
| Herd Production Level (305d Kg) | 6,330            | 6,201            | 8,950            | 12,300           |       |
| Production System               | Seasonal Grazing | Seasonal Grazing | Indoor Intensive | Indoor Intensive |       |

The clear outcome from this set of research trials is that CritiCalc provides excellent results across a wide range of dairy production systems, with a broad spectrum of; milk production levels, genetic merit levels and diets. In fact, when taken individually or as a whole the rate of improvement in various performance parameters are very consistent no matter the level of milk production or herd diet.

These results also demonstrate that CritiCalc has shown consistent results over three years of research and in many herds. In all of the these research trials the CritiCalc cows received 2 CritiCalc boluses (one at calving and a second 12 hours later), whilst Control cows received no bolus.

# Research Report

## 1. Post-partum Metabolic Disease Levels

|           | n   | Clinical Milk Fever | Retained Placenta | Uterine Infection | Displaced Abomasum | Ketosis |
|-----------|-----|---------------------|-------------------|-------------------|--------------------|---------|
| Control   | 135 | 8.9%                | 3.0%              | 10.4%             | 0%                 | 0%      |
| CritiCalc | 128 | 3.9%                | 0.8%              | 1.6%              | 0%                 | 0.8%    |



Reductions in Clinical Milk Fever cases amongst the CritiCalc group were recorded in all 4 trials (A, B, C and D). In terms of Uterine issues the CritiCalc group also recorded a reduction in cases of retained placenta (>24 hrs post-partum) and a very large drop in recorded cases of Uterine Infection (Metritis and Endo Metritis) from 10.4% in the Control group down to 1.6% in the CritiCalc group.

One of the key aims of using the CritiCalc bolus is to help the cow get through the critical transition period by reducing her risk of costly post-partum metabolic diseases. To do this the CritiCalc bolus contains 2 very effective anti-oxidants, rumen protected Se and Vit E. As can be seen by these results, the CritiCalc group experienced noticeable reductions in cases of clinical milk fever, retained placenta and uterine infections.

Previous research has shown fertility and production benefits to cows not affected by early lactation uterine infections. The CritiCalc group demonstrate superior performance in this regard and the benefit of this is shown in terms of milk and fertility performance.

## 2. Energy Status:

Another key challenge in successful transition cow management is that of boosting energy status and reducing the severity and duration of negative energy balance in early lactation. Addressing this issue was another key aim of CritiCalc and a key focus of this research.

In order to ascertain the early lactation energy status of Control and CritiCalc cows in our research we looked at 3 key parameters; **A.** Milk BHBA levels, **B.** Body Weight Change and **C.** changes in Body Condition Score in early lactation.

# Research Report

## A. Milk BHBA Levels

After calving, the cow's demand for energy (to support milk production) increases at a higher rate compared to her energy supply (Dry Matter Intake) which results in an unavoidable period of negative energy balance. In order to address this energy deficit the cow must mobilise adipose tissue/body fat reserves, a process that is carried out in the liver. A by-product of this process is the creation of ketones which then circulate in the blood, milk and urine. The higher the rate of body fat mobilisation, the higher the rate of circulating ketones. A common way to monitor early lactation energy status is to measure and record the level of circulating ketones in the milk or blood of a reference group of cows in the herd.

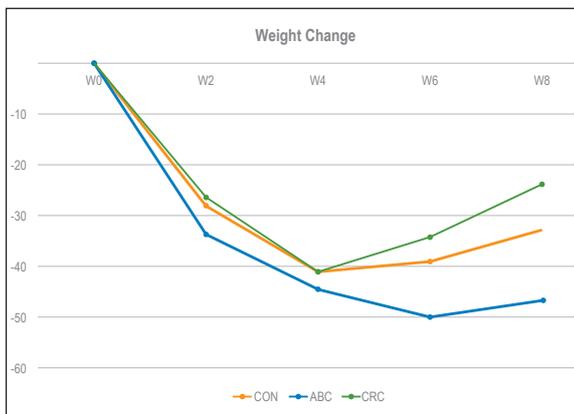
During our research we took milk samples at d14 and d21 (Trial A) or d28 (Trial B) and tested them for their Milk BHBA (beta-hydroxy butyric acid) levels. BHBA is known to be the most relevant ketone to measure the rate of fat mobilisation in early lactation cows, with a lower score being favourable as it indicates a lower level of fat mobilisation or more favourable energy status. A Milk BHBA result above 2.0mg/dL indicates that the cow is experiencing sub-clinical Ketosis.

### Milk BHBA Results:

| Milk BHBA (mg/dL) | Trial A |        |        |         | Trial B |        |        |         |
|-------------------|---------|--------|--------|---------|---------|--------|--------|---------|
|                   | n       | Test 1 | Test 2 | P—Value | n       | Test 1 | Test 2 | P—value |
| Control           | 51      | 0.65   | 0.69   | P<0.05  | 30      | 1.03   | 0.92   | P<0.05  |
| CritiCalc         | 52      | 0.46   | 0.42   | P<0.05  | 31      | 0.45   | 0.32   | P<0.05  |

These results shown that at both timepoints and in both trials that the CritiCalc cows have a statistically significant reduction in their Milk BHBA results, indicating that they are mobilising less body fat and are in better energy status in the critical first month of lactation.

## B. Body Weight Change



In Trial B we took a closer look at the dynamics of early lactation energy status and how the various cow groups were partitioning the energy available to them. In the first part of this study we looked at how body weight changed amongst the cow groups at week of calving and weeks 2, 4, 6 and 8 into lactation. In this trial also there was a 3rd treatment group which received a calcium only bolus treatment (ABC).

We can see that the CritiCalc group (CRC, green line) and Control (CON, orange line) both lose weight for 4 weeks and then start to increase weight for the next 4 weeks with the CritiCalc group losing the least bodyweight from week 0 to week 8; CRC—24kg, CON—32kg and ABC—47kg. These results were not significant

# Research Report

## C. Body Condition Score Change



During Trial B we also monitored the rate of body condition score change at week 0, 2, 4, 6, 8, and 12, in order to give a clear profile of body condition loss and subsequent recovery over the critical first 3 months into lactation.

In this trial we can see that the CritiCalc group (CRC, green line) do not lose as much body condition in the first 6 weeks into lactation and maintain a higher level of body condition at all timepoints to week 12 compared to the Control (CON, orange line) and Calcium-only treatment (ABC, blue line).

One of the most interesting findings of this trial is the fact that the rate of body condition recovery from week 6 to week 12 is much steeper for the CON and ABC groups compared to the CritiCalc group. This suggests that the CON and ABC groups have to partition more of their energy reserves towards body condition recovery during this phase of lactation. There was a statistical trend of a difference between CritiCalc and ABC at Week 6.

### 3. Milk Production Performance

The milk production performance of the CritiCalc groups has been consistently improved across all 4 trials, when compared to Control groups, with statistically significant results being in Trials B and D.

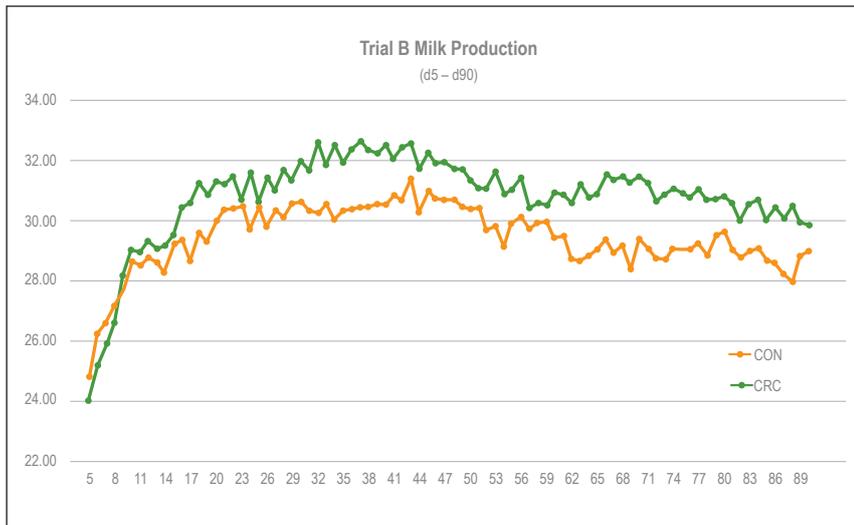
| Milk Production d3—d90 (kg/day) | Trial A     | Trial B     | Trial C     | Trial D     |
|---------------------------------|-------------|-------------|-------------|-------------|
| Control                         | 28.6        | 29.4        | 35.7        | 45.9        |
| CritiCalc                       | 29.2        | 30.7        | 37.2        | 48.1        |
| Difference                      | <b>+0.6</b> | <b>+1.3</b> | <b>+1.5</b> | <b>+2.2</b> |
| P-Value                         | ns          | P<0.05      | ns          | P=0.03      |



# Research Report

## Milk Production

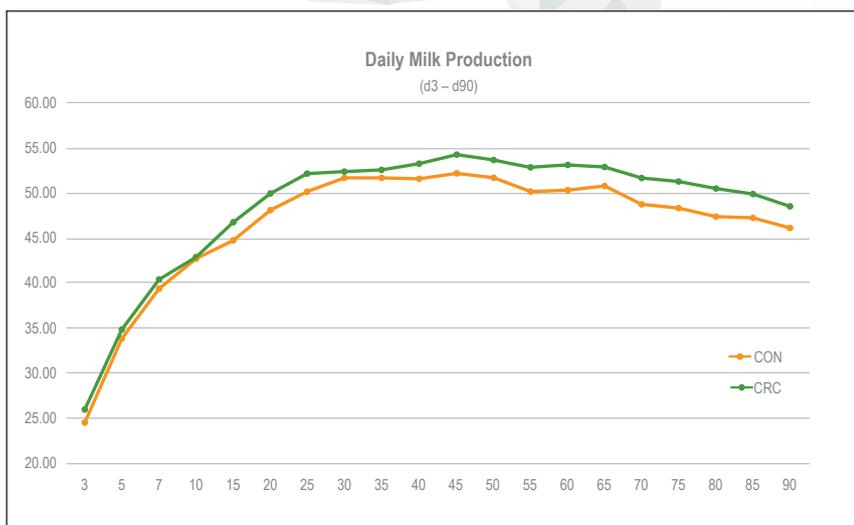
### Trial B Milk Production Profile



In this trial we can see that production levels between the cow groups are very similar until ~ day 14 of lactation and then the CriteCalc group start to increase production above that of the Control group.

This increased production is +1.3kg/day (+4.4%) for the first 90 days of lactation and remains for the entire lactation. This is a statistically significant finding.

### Trial D: Milk Production Profile



In this trial of very high yielding cows (305d—12,300kg) we can see that the CriteCalc group increase production by +2.2kg/day (+4.7%) over the first 90 days of lactation (P=0.03).

We can also see in this trial that production levels between the two cow groups are very similar for the first 14 days of lactation, then the CriteCalc group start to increase their production above the Control group. This increase is maintained for the entire lactation with a difference at the end of the lactation of +614kg or +2kg/day (p=0.11) over the entire lactation.





## Research Report

### Research Conclusions

*Administration of 2 CritiCalc boluses at calving has been shown to be a very effective way of helping transition cows to better perform to their genetic potential in lactation.*

*By reducing instances of metabolic disease challenges and improving early lactation energy status the cow is seemingly able to increase milk production earlier and thus enjoys a production benefit that is lactation long.*

*The resulting reduction of health related costs and increase in milk sales makes a significant contribution to herd profitability and provides a strong return on investment for the farmer. No matter the production level or system CritiCalc consistently performs for your transition cows and for you.*

*For more details contact:*



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