



TECHNICAL BULLETIN

Oral-Pro Balance is a nutritional/metabolic supplement formulated to balance the osmotic and the buffering effect needed to maintain hydration and corrected pH when heat stress challenges occur due to environmental heat and handling. Oral-Pro Balance is formulated using electrolytes and buffering agents and does not use sugar as a filler. Increased carbohydrates are contra-indicated due to its effect on blood pH. It contains zinc to aid in the maintenance of cellular integrity and tight junction integrity in the gut. In the face of prolonged heat period, the buffering effect of Oral Pro Balance helps to reduce a metabolic alkalosis crisis that develops with heat stress, whether it is environment or transportation or processing of any sort.

What happens when animals have heat stress? We know of the external signs, panting, increase body temperature, and increase water intake in the acute phase, however, a net dehydration occurs as the stress continues.

To answer the questions of what happens metabolically and how to correct the metabolic changes we placed two groups of growers in a heated barn that mimicked a week in southern Indiana during the summer of 2012. Like the animals in Indiana, pigs in our study were exposed to temperatures of 105°F for 5 consecutive days with night time temperatures at 85°F. Two room vaporizers/humidifiers were used to provide high humidity as well. Clinical evaluation, rectal temperature, feed intake (data not shown), water intake and blood pH and base-excess were measured. Other blood gas measurements were also taken; data not shown.

The objective of this trial was to evaluate the effects of pigs receiving Oral-Pro Balance (n=10) versus those not receiving treatment (n=5) during very high heat and humidity for five consecutive days.

The normal pH of blood is 7.4. Excessive panting leads to reduced CO₂ levels in the blood, thus reducing the bicarbonate buffer effect and increasing the pH. This causes the pig to become lethargic. They reduce feed intake, and drink less. Controlling pH will also help to maintain hydration and avoiding shrinkage thus improving meat quality. Small changes in pH are giant challenges even in healthy animal.

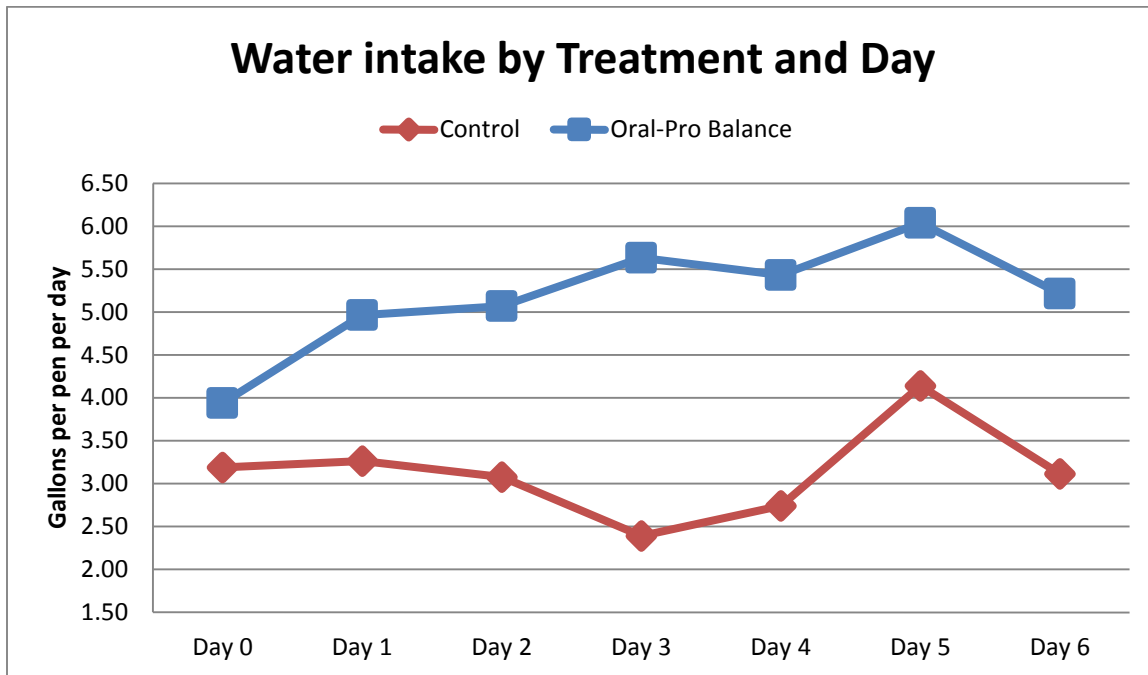
Base excess is a calculated value using blood bicarbonate levels and blood pH. It represents the amount of acid it would take to bring the pH of the blood back to normal. It may be caused by panting, a respiratory problem, causing a buildup of CO₂, hence respiratory acidosis; the kidneys then attempt to compensate for the low pH by raising blood bicarbonate. The kidneys only partially compensate, so the patient may still have a low blood pH, i.e. acidosis. In summary, the kidneys partially compensate for respiratory acidosis by raising blood bicarbonate.

The following is a list of parameters we evaluated and results:

Water intake

Control group- the pigs initially drank water at an increased rate, and then beginning on day 3, the water consumption was reduced leading to dehydrated pigs.

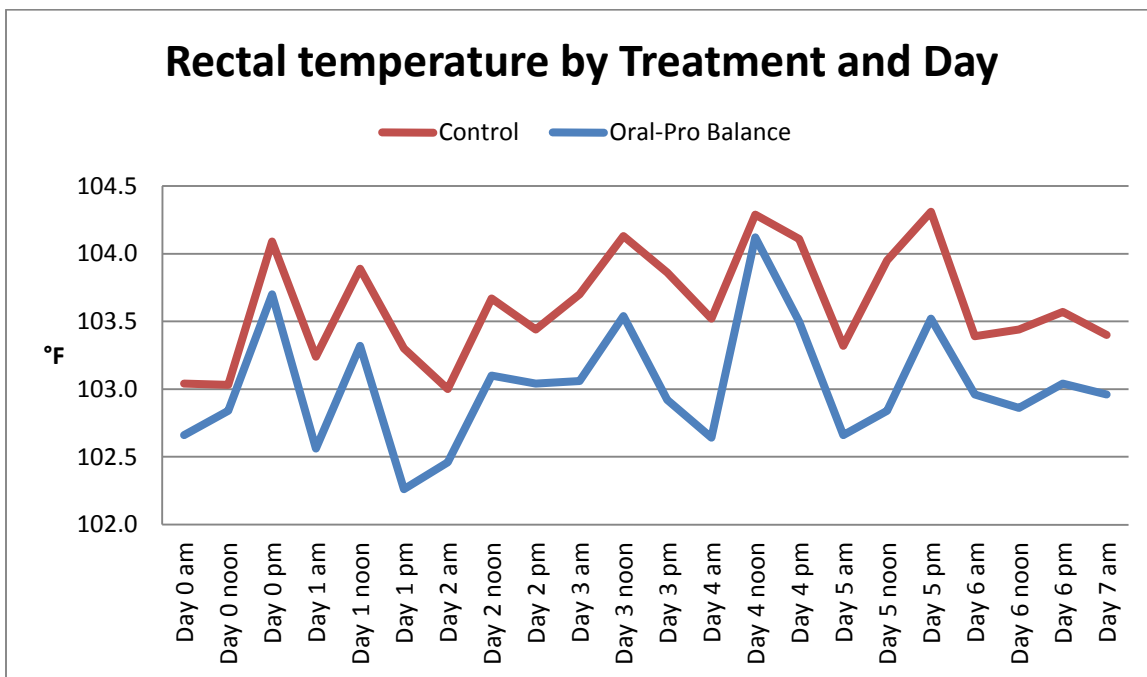
Oral-Pro Balance group - Water consumption increased daily till the end of the heat period; there was no evidence of dehydration in treated pigs either by clinical observation or blood gas analysis.



Rectal temperatures

Control group – the rectal temperatures were elevated as the environment temperature increased

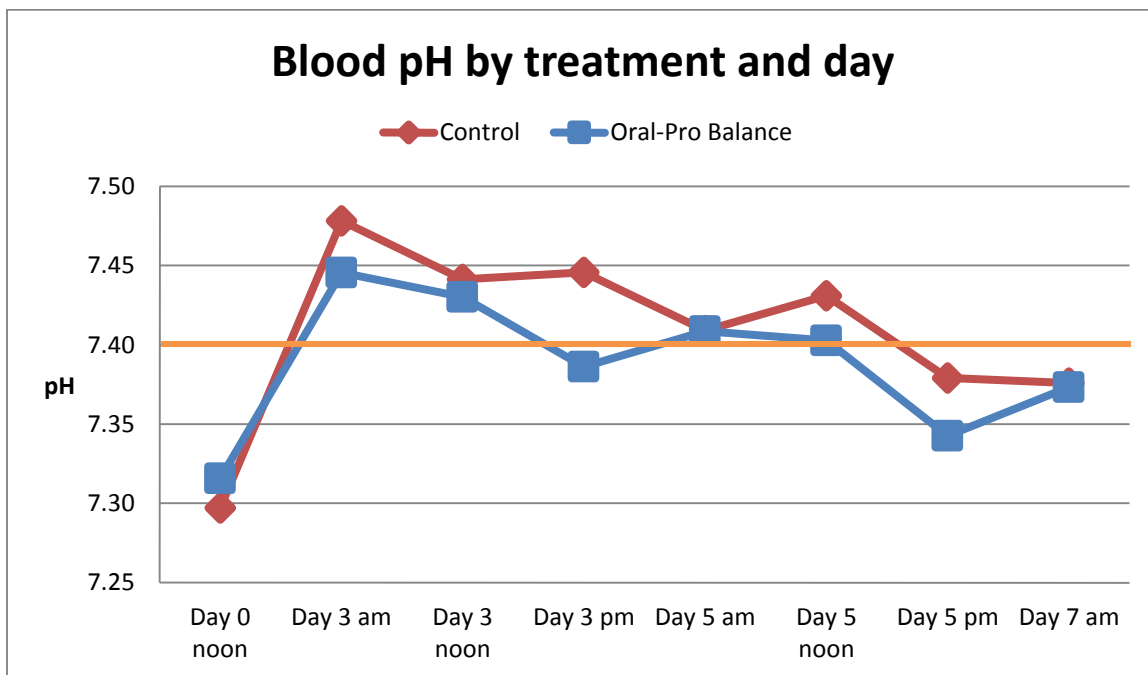
Oral-Pro Balance – the rectal temperatures were consistently lower as compared to the control group.

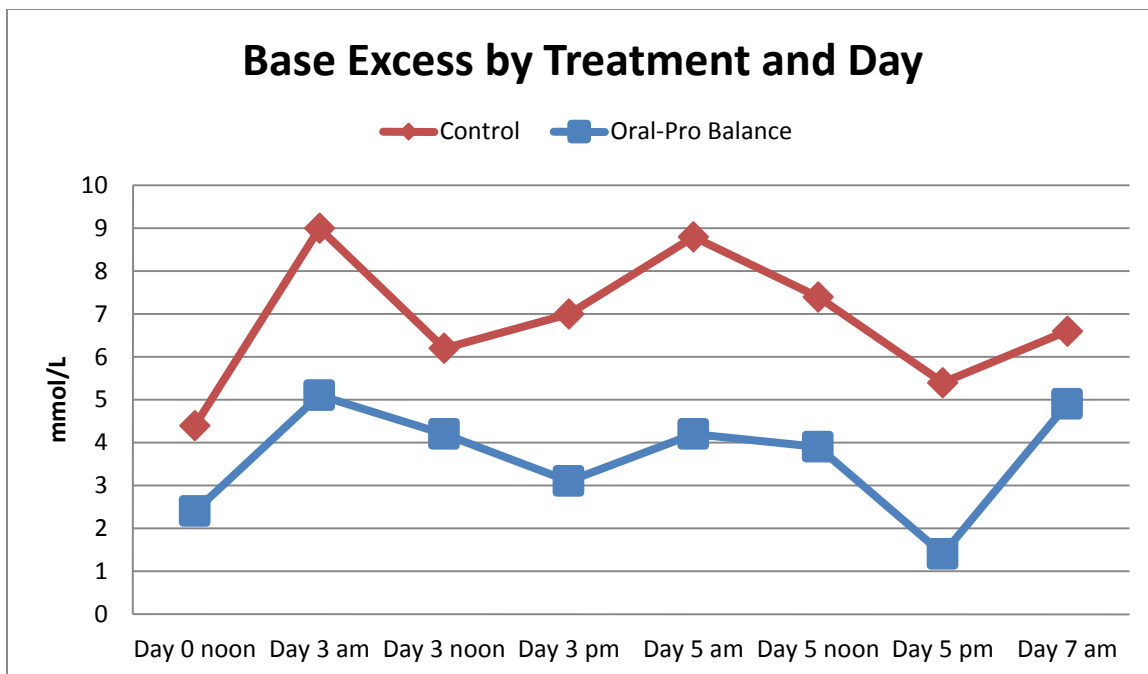


Blood pH and Base-excess (BE)

Control group - consistently showed higher blood pH values and high Base-excess.

Oral-Pro Balance group – Buffered the blood resulting in a more normal pH and base-excess as compared to the control group.





Use Oral-Pro Balance prior to stressful heat or handling event. The balancing and buffering effect will give your livestock:

- Increased water consumption
- Reduction of body temperature in a high heat environment
- Reduced panting of the heat-stressed animals, thus reducing the pH of their blood and maintaining a healthy and more responsive metabolic system. This will help meat quality in slaughter animals and may reduce the incidence of **Dark Cutters** in cattle.
- A quicker rebound after any stress in production animals, either from excessive heat or handling
- Less shrinkage in processed animals and a better cut out.
- Greater meat and milk production when environmental conditions are less than optimal.