

## **EFFECT OF ONE-TIME ORAL CELL-RATE™ APPLICATION ON NEWBORN BEEF CALVES**

The aim of this study was to determine the effect of a one-time oral dose of Cell-rate™ at birth on calf health and immune status. Twelve colostrums-deprived, newborn, beef calves (81.35 + .32 lb initial body weight) were assigned randomly to either milk replacer only or milk replacer plus Cell-rate™. Milk replacer was fed by dry powder weight at 0.7% of the birth weight of each calf. Milk replacer was fed reconstituted at 2 quarts warm water within 2 hours of birth. Treatment calves received Cell-rate™ in the milk replacer at the first feeding only. Other feedings in first 24 hours for both groups was milk replacer only. Thereafter, calves were allowed to suckle dams. A rabies vaccine was administered at birth. Calves were weighed on days 0, 7, 14, and 21. Scours incidence was scored [2-point scale (0 = normal; 1 = scours)] daily for 3 weeks. Morbidity, mortality and treatment were recorded. Jugular blood was drawn from each calf immediately after birth (prior to feeding or other post-partum processing); at hour 6, 12, 24 and 48; and day 7, 14, and 21, and analyzed for immunoglobulins G (IgG) and M (IgM). Cell-rate fed calves tended to have higher IgG levels (P = 0.08) than controls (251.7 ± 26.8 vs 175.0 ± 28.3 mg/dl). Cell-rate™ fed calves had a higher IgM (P = 0.03) than the control calves (70.0 ± 9.9 vs 34.0 ± 10.2 mg/dL). Results suggest that a one-time oral dose of Cell-rate™ at birth may enhance immune status of neonatal beef calves by increasing immunoglobulin levels.

*What is the significance of increasing immunoglobulin levels?*

Immunoglobulin plays an essential role in the body's immune system as they are proteins found in blood. This protein is called an "antibody" and is an important part of the body's defense against disease. When the body is attacked by harmful bacteria or viruses, antibodies help fight these invaders. They attach to foreign substances, such as bacteria, and assist in destroying them. Immunoglobulin is abbreviated Ig. The classes of immunoglobulins are termed immunoglobulin A (IgA), immunoglobulin G (IgG), immunoglobulin M (IgM), immunoglobulin D (IgD) and immunoglobulin E (IgE).

Immunoglobulin IgG is present in the largest amounts in blood and tissue fluids. IgG antibodies are found in all body fluids and are very important in fighting infections. They are the most common of the five major types of antibodies. In horse, cattle and sheep IgG cannot pass through the multiple placental membranes and is therefore only available to a newborn by colostrum intake. For this reason it is extremely important to help increase the IgG level in newborns. As shown above, the use of Cell-rate™ in a single dose application can help newborns increase IgG. If IgG is present the animal has immunity allowing it time to start manufacturing its own IgG. If IgG is not present or in low levels, animals have poor defenses against any infectious agent to which it might be exposed.

Immunoglobulin IgM is a basic antibody that is present on B cells. It is the primary antibody against A and B antigens on red blood cells. IgM is by the far the physically largest antibody in the circulatory system. IgM remains in the bloodstream where it can kill bacteria that enter the blood stream. IgM in normal serum is often found to bind to specific antigens, even in the absence of prior immunization. For this reason IgM has sometimes been called a "natural antibody". This phenomenon is probably due to the high avidity of IgM that allow it to bind detectably even to weakly cross-reacting antigens that are naturally occurring in nature.