



Immu-Boost™

Technologies For Calf Immunity

by Dr. Dan DuBourdieu



The inherent immune system of adult animals such as cows is an amazing system that normally does a good job of keeping adults from getting sick. While nature has done a good job for adults, newborn and young animals such as calves have a harder time dealing with enteric conditions such as scours since their inherent immune system has not formed yet or is only partially formed. Nature deals with this problem in newborn calves whereby a preformed antibody in the mother's colostrum milk is given to the calves. This is called passive immunity, and occurs when preformed antibodies from one animal are given to another animal to protect that other animal from diseases. But one issue that nature has not fully dealt with is the type and amounts of specific antibodies that can be delivered to a newborn calf.

Fortunately technology has overcome this problem through the use of chicken egg antibodies. It is not necessary for the preformed antibodies used in passive immunity to be of the same species to provide protection. This allows the use of preformed chicken egg antibodies to provide passive immunity. Manufacturers can hyper immunize chickens against a wide variety antigen from many diseases to create the passive antibodies. Antibodies against these diseases wind up in the yolk of the chicken egg and these can be given to a newborn animal to protect that newborn. However, the method in which the chicken egg is subsequently processed can make a large difference in the success and efficacy of product that a manufacturer might provide. It is better to keep antibodies in a liquid state to protect them from denaturation during manufacturing.

This stabilized liquid egg technology has now been achieved in a product called Immu-Boost™. Using a patented process to keep the chicken egg antibodies in a stabilized liquid state, R&D

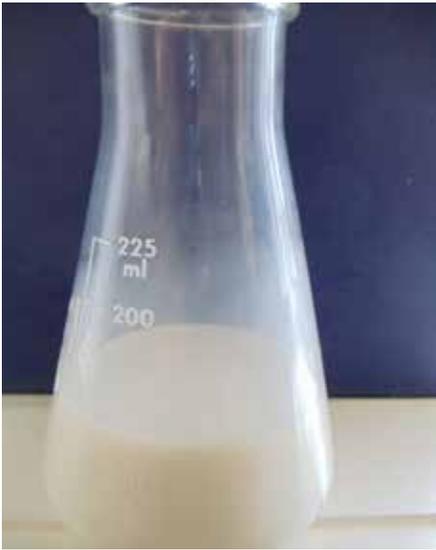
LifeSciences® has developed Immu-Boost™ as a liquid chicken egg product that does not contain denatured antibodies that spray dried powders can have. The advantages that liquid chicken egg antibodies in Immu-Boost™ has over spray dried

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chicken egg powders therefore include the fact that the liquid antibodies will not be denatured during manufacturing (Table 1). Furthermore, the patented process protects the liquid antibodies when they pass through the stomach and into the intestinal tract where they bind pathogens and prevent diseases. Spray dried antibodies, not having this patented process, will be destroyed by enzymes and other factors during that passage through the stomach and become less effective in the intestinal tract. In addition, the liquid Immu-Boost™ concentrate can simply be diluted into milk replacer and watering systems to feed numerous animals. The liquid Immu-Boost antibodies will immediately and completely mix into water or milk replacers without leaving any undissolved residues (Picture A).

Having undissolved residues even after significant time of mixing is a problem that spray dried or freeze dried egg powder have and lead end users to wonder how efficacious these powders might be if it's not all going into solution. (Picture B) Questions start to arise such as; did every calf get

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Picture A - Immu-Boost® in milk
No precipitate present



Picture B - Spray dried chicken egg antibodies in milk
Undissolved precipitate present

the same amount of egg antibodies? Is my egg powder sitting at the bottom of my mixing tank?

Scours is an important problem that calves face that require attention from the producer. The causes of scours in calves include E coli, Rotavirus, Coronavirus, Cryptosporidia, Salmonella and other diseases. Three of these main causes of diarrhea (Rota virus, Corona virus, and Cryptosporidium) in states like California are not affected by any antibiotic currently available.¹ As such, antibody use is one of the best ways to then maintain normal health in calves when stress of scours occurs. Therefore it is important that antibody products being used to maintain normal health in calves should include antibodies to these specific disease causing microbes. Immu-Boost® contains specific antibodies against the important strains of E.coli, Rotavirus, Coronavirus, Cryptosporidia, Salmonella, Clostridia and others microbes that cause scours and will help maintain normal health for these calves.

Clinical trials have shown that the antibodies in Immu-Boost™ can cross protect against various species of the same genus of pathogen. Research carried out at the University of Arkansas on chicken health has shown cross protection against a number of species of Clostridia (Table 2). This is consistent with Immu-Boost™ being able to protect animals against a wide assortment of diseases even if an animal may not have received this protection in the initial colostrum from its mother.

In addition, Immu-Boost™ can help general health status of the animals through improving the GI tract function. Immu-Boost™ significantly increased the height of intestinal villi and increased the crypt depth in the Arkansas study. This is consistent with animals being able to achieve better health with the use of Immu-Boost™ (Table 3).

Table 1

Form of Antibodies	Denatured Antibodies Possibility in Manufacturing	Residues when Dissolved	Ease of Use in Watering Systems	Protected Passage to the GI Tract	Cross Protection to Various Pathogens	Patented Technology
Liquid Immu-Boost™ Antibodies	No	No	Yes	Yes	Yes	Yes
Spray Dried Powder Antibodies	Yes	Yes	No	No	Unknown	No

Table 2

Treatment	Positives and Total Number	Organisms Cultured	Rate of Positive ID of Bacitracin Resistant Clostridium
Control given no egg antibodies. 5 strains of Clostridium cultured.	10/13	Clostridium difficile (3) Clostridium sporogenes (3) Clostridium perfringens (2) Clostridium butyricum (1) Clostridium tertium (1)	77%
Immu-Boost™ containing 2 strains of Clostridium, given for 42 days	0/10	None	0%

Table 3

Treatment	Villi Height (Micrometers)	SEM	Crypt Depth (Micrometers)	SEM
Control	842.075	14.237	225.384	4.156
Immu-Boost™ given for 42 days	1063.731	16.426	305.176	4.845
P Value	<.0001		<.0001	

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Conclusions

Chicken egg antibodies against specific diseases are a viable alternative to antibiotics to protect animals against diseases. While spray dried egg powders can help they are not optimal and do not contain the same level of activity. The new liquid technology is superior for achieving optimal health.

Only Immu-Boost™ has the patented technology and ability. Immu-Boost™ liquid antibodies have shown efficacy for increasing intestinal villi height, while cross protecting against a wide variety of strains of intestinal pathogens. Immu-Boost™ is manufactured solely in the USA under the cGMP and ISO quality systems. Immu-Boost™ is the next generation technology for full antibody activity and optimal health.

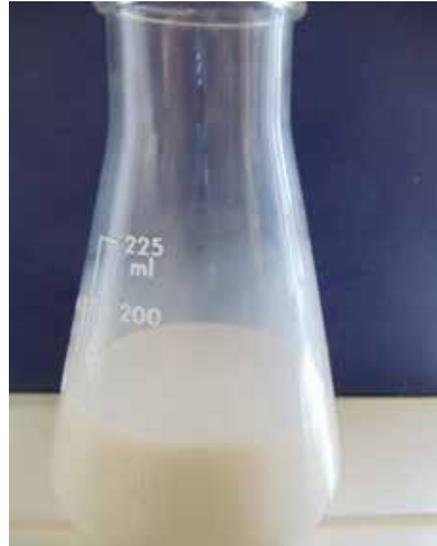
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References

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2. Immu-Boost™ Clinical Trial in Broilers. Susan Watkins DVM. Professor. University of Arkansas, 2013.



Spray dried antibodies in Milk



Immu-Boost™ antibodies in Milk