

## Why NanoPro<sup>PRP</sup>'s Colostrum Is the World's Best

The colostrum used in NanoPro<sup>PRP</sup> is the best in the world for two reasons:

- 1) BioPharma uses the very best bovine colostrum in the world, sourced in the USA.
- 2) We fortify it with proline-rich polypeptides (PRP), and immune and growth factors, in NanoSorb<sup>TM</sup>.

In the past, most US produced colostrum was not fit for human consumption. There are no US standards for producing human grade colostrum, and claims by manufacturers that their colostrum meets USDA processing standards means only that the product is fit for consumption by *animals*, a far less stringent standard. BioPharma Scientific procures its colostrum from a private manufacturer located in the Southwest U.S. that produces the highest quality, human grade colostrum from US dairy sources.

### Processing facility designed for colostrum processing only

The processing facility was designed by engineers as a state of the art processing facility for the sole purpose of producing the best quality colostrum and colostrum fractions in the world. That facility is able to produce colostrum with an IgG content up to 40%, and the percent IgG is guaranteed. In a recent study, most independent samples taken from health food stores in the United States of colostrum claiming 25% IgG on the label tested on average 12% IgG using independent lab RID and HPLC tests! With BioPharma's colostrum ingredients you can be assured that what is on the label is in the product.

### Processing facility designed for the highest PRP content

### Other processing facilities not designed for colostrum

In many parts of the world colostrum is only produced seasonally as calving is limited to only once a year. Since it would be uneconomical for these countries to establish dedicated facilities for colostrum processing, they instead use large dairy factories to process it. Since these dairy factories were not originally set up to process colostrum, there can be problems with overheating during pasteurization, which can cause *denaturation* of the proteins in the colostrum and destroy the efficacy of the end product. This is not a problem with the processing facility we use because it has been designed for and used exclusively for colostrum processing. It also runs year round as dairy cows in the U.S. Southwest are not limited to seasonal calving.

### Colostrum sources

BioPharma uses only colostrum collected only from Grade A dairies located in the Southwest of the United States. These farms get their water from large underground aquifers and/or from the Colorado River from soils that are DDT free. The cows are fed grass grown on the fertile plains of the lower Colorado River and then trucked to the dairy farms. No artificial feeds or feeds containing animal parts are used. The dairy farms are very large with 1000-8000 cows. This large size allows colostrum producing cows to have their own milking barn, so there is no potential of contamination of the colostrum with raw milk. It also allows calving cows to be supervised around the clock because the larger farms can afford sufficient staff to do this, something small farms cannot do. Cows are housed in spacious barns where temperatures are maintained at 70-75°F with misters. The dry desert climate helps minimize insect populations compared to wetter climates.

Colostrum is collected both fresh and frozen from local farmers in Arizona, all of whom are located within an hour of the processing facility. Fresh liquid colostrum is stored below 40°F before processing. Frozen colostrum is thawed and homogenized to restore the casein micelles, which prevents damage to the proteins<sup>1</sup>. Collected colostrum is processed daily to ensure maximum freshness and quality. In contrast, colostrum collected in New Zealand and the Northern US are only collected during spring calving season, so it may be as old as a year before reaching consumers.

## **IgG level**

IgG levels are tested and certified in-house at all stages of production using both RID and HPLC which measure not only levels of IgG but *bioactivity* as well. This is important as many commercial colostrums have very low bioactivity for their IgG due to poor processing procedures. We use whole colostrum as it is richest in bioactive substances, especially *proline rich polypeptides (PRPs)*. The concentration of PRPs in whole colostrum powder is usually between 1-3% of the total powder weight. Most manufacturers of colostrum powders remove the PRP fraction, lactose, minerals and water, using ultrafiltration technology, to elevate the protein content of the powder. This then reduced the immune balancing effectiveness of the colostrum powder. The PRP content of BioPharma's whole colostrum is typically over 6%!

Our colostrum supplier also uses certain advanced processes to stabilize the colostrum cream and prevent the colostrum from going rancid.

## **Low heat processing and drying**

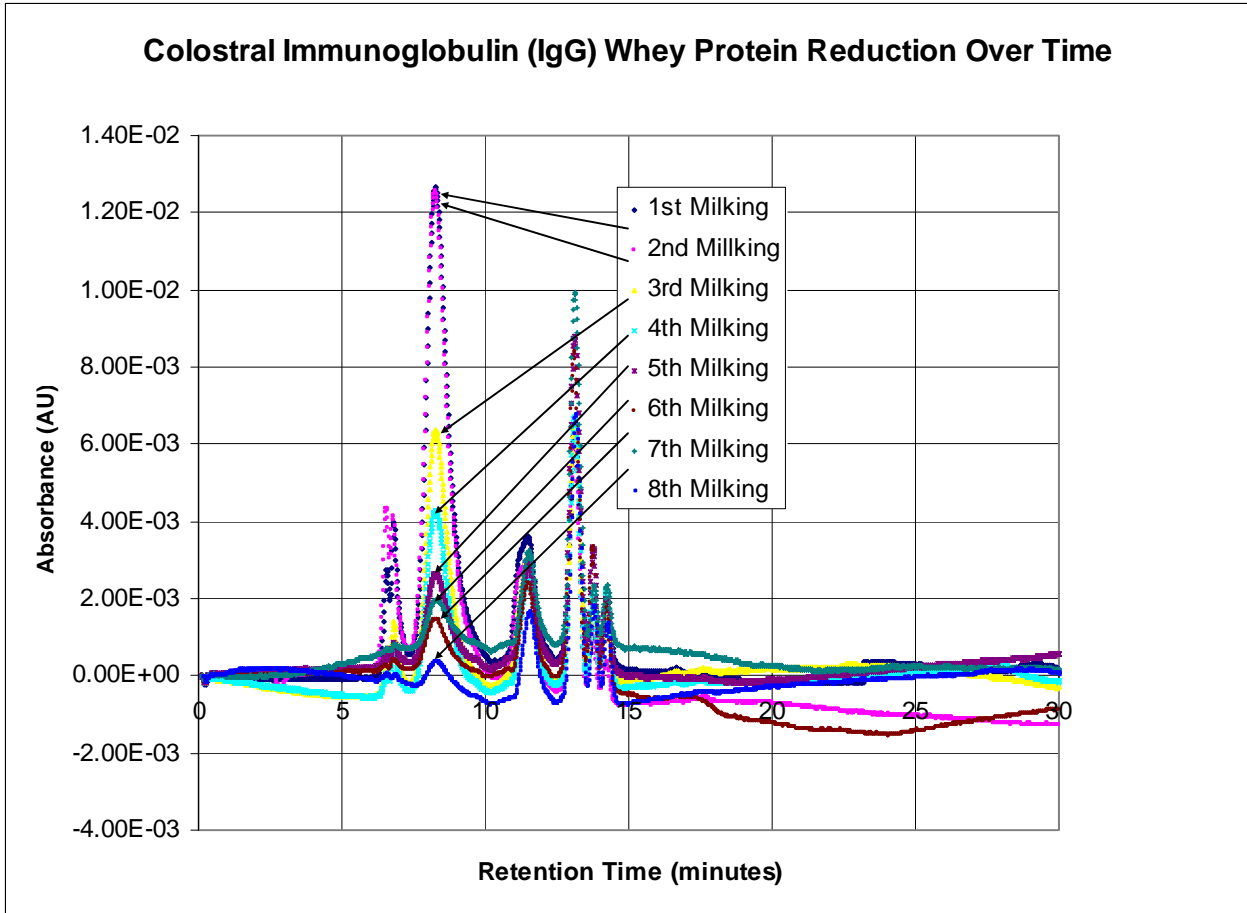
Most producers of colostrum use high heat pasteurization and drying processes which can denature the IgG and other proteins in colostrum. Our colostrum is flash pasteurized to keep heat and duration minimal while still removing any harmful pathogens from the colostrum. Our processing plant employs a special High Temperature Short Time (HTST) pasteurizer which meets all USDA Pasteurization Ordinance (PMO) requirements. Using this method, immunoglobulins and other biologically important proteins retain their bioactivity, whereas batch pasteurization methods, using longer times, denatures these proteins.

Batch pasteurization, such as is done with commercial milk, can destroy up to 58% of the IgG in colostrum<sup>3,4</sup>. Ultra High Temperature (UHT) processing or sterilization of colostrum or milk, as is done when preparing infant formulas, removes all IgG and other protein activity<sup>5,6</sup>. Temperature and time at temperature are both important in maintaining IgG activity in colostrum. The higher the temperature, the shorter the time it takes for the IgG to become completely denatured<sup>7</sup>. Other components of colostrum likewise can withstand pasteurization but not higher temperatures. *Insulin-like growth factor (IGF)* can withstand 79°C for 45 seconds but not 121°C for 5 minutes<sup>8</sup>. *Lactoferrin*, one of the major colostrum proteins with antimicrobial and many other effects, is unaffected by pasteurization, but UHT treatment decreases its ability to bind various bacterial species and destroyed its ability to inhibit bacterial growth<sup>9</sup>. Pasteurization reduces mineral content (iron, copper and zinc) but not to a significant degree<sup>10</sup>. Sufficient levels remain in the colostrum to meet the needs of the infant.

After flash pasteurization, our colostrum is spray dried at temperatures of less than 145°F to produce a high quality powder while protecting the colostrum proteins. Unlike many colostrum producers, an indirect steam heating method is used to dry the colostrum. This eliminates dangerous nitrogen oxide chemicals produced in direct fired natural gas burners. Engineers developed a tall form spray dryer which produces a laminar airflow, thus eliminating any brown or burned compounds in the final powder product. All sediment tests on our colostrum powder are Grade A (no brown or black particles at all). Not all colostrum producers can claim this!

## **First and second milking only**

First and second milkings after calving are the richest in immunoglobulins, growth factors and protein peptides. Only these first milkings collected after the calves have had their fill are used in our colostrum. We do not accept watered down or third or fourth milkings. Some suppliers used third and fourth milkings to get up their volumes because they are using large milk processing plants not designed for colostrum processing. As can be seen in the HPLC graph below, first and second milking colostrum has a higher IgG/(alpha-lac + beta lac) ratio than third, fourth and subsequent milkings.



As the table below shows, important immune and growth factor concentrations in colostrum decrease over time, other factors, such as lactose, increase. Lactose is important for provoking the allergic-like response in lactose intolerant individuals, so the less lactose in the colostrum, the less likely it will provoke this response.

	Total (i) Protein %	Casein %	Albumin %	Fat %	Lactose % (ii)	Ash %	Total Solids % (iii)
0	17.57	5.08	11.34	5.10	2.19	1.01	26.99
6	10	3.51	6.30	6.85	2.71	0.91	20.46
12	6.05	3.00	2.96	3.80	3.71	0.89	14.53
24	4.52	2.76	1.48	3.40	2.98	0.86	12.77
36	3.98	2.77	1.03	3.55	3.97	0.83	12.22
72	3.86	2.70	0.97	3.10	4.37	0.84	11.86

Source: Immuno Dynamics, Inc. ICN Biomedical, Inc. Cosa Mesa, CA.

- (i) Contains Cytokines and other protein compounds of very low molecular weight that act as Biologic Response Modulators (BMR's), which intervene locally in most biological processes.
- (ii) Lactose has a great influence on allergic-like responses experienced by some individuals due to the lack of lactase and B-Galactodidase. Unlike immunoglobulin IgG, lactose rises in value from the first milking through the subsequent several milkings.
- (iii) Total solids are determined by the dried solids by the original quantity of liquid started with.

## Antibiotic free

All of our colostrum is collected from US Grade A dairies and is certified antibiotic free. Every batch is tested to ensure standard quality.

## Solubility

The colostrum powder is partially agglomerated to ensure consistently sized particles which will dissolve rapidly in liquids.

## Quality assurance

BioPharma's colostrum is processed using "Good Manufacturing Processes" (GMP), and is Health Certified with the USDA. The facility is also registered with the FDA, and the laboratory is registered with the US Government as a clinical laboratory. A microbiological analysis is conducted on every 5<sup>th</sup> box in each batch prior to shipment, and all product passes through a metal detector and powder sifter.

## BioPharma creates a "Super Colostrum" through PRP enhancement in our patented NanoSorb™

The whole colostrum BioPharma uses, produced as above, is already exceedingly rich in peptide *zoonutrients* that modulate immune function and support tissue regeneration and healing. Indeed, these *bioactive peptides* have even been extracted for use as stand alone nutraceutical products. However, these very small amino acid chains, once they are separated from the protective glycoprotein enzyme inhibitors in colostrum, cannot survive the harsh gastric environment. Therefore, these PRPs, with their associated immune and growth factors, when taken as a immune balancing nutraceutical extract are sprayed into the mouth and absorbed sublingually.

However, BioPharma has found a way to encapsulate these extracted peptides into our **NanoSorb™** technology. **NanoSorb™** protects them from stomach acids and enzymes so that they may be ingested as food. Indeed our technology delivers these nutrients most especially to *Peyer's Patches*, the immune lymphoid tissue of the small intestine!<sup>11</sup>

BioPharma had thereby taken the highest quality bioactive whole colostrum and "super-charged" it to create, gram for gram, the most powerful zoonutrient functional food of its kind.

## Conclusion

By procuring the very best sources, using very best processing methods, and then fortifying that colostrum with colostrum *bioactive peptides* in protective NanoSorb™ liposomes, BioPharma provides the purest and most zoonutrient dense colostrum in the world.

Every 18 gm serving of **NanoPro<sup>PRP</sup>** provides 2 full gm of this "Super Colostrum".

## References

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