

## Composition of First Milking Colostrum (collected in first 6 hours)

Hours After Birth	Protein	Casein	Albumin	Fat	Lactose
0	65.1	18.82	42.02	18.9	8.11
8	48.9	17.16	30.79	33.48	13.25
12	41.64	20.65	20.37	26.15	25.53
24	35.4	21.61	11.59	26.62	31.17
30	29.42	18.78	8.8	25.95	31.33
36	32.57	22.67	8.43	29.05	32.49
48	32.64	22.95	8.64	24.43	34.64
72	32.55	22.77	8.18	26/14	36.85
96	31.73	22.62	6.92	29/60	39.83

From the chart above, it is very obvious how fast the relationship of the biologically active components in bovine colostrum changes after birth of the calf. Recognizing this changing relationship is extremely important in defining what bovine colostrum really is and in assuring that it contains the maximum amount of biologically active substances.

### **Protein.**

Most of the biologically active substances in complete bovine colostrum that can convey significant health benefits are proteins. Since almost all of the beneficial proteins are conveyed from the mother's bloodstream into the colostrum before birth and the mother then begins to reabsorb them about 6-8 hours after birth, it is important to use colostrum that has been collected during a time period that will minimize the effect of the reabsorption process. Of real significance is the fact that by 24 hours after birth most of the proteins in the udder fluid can be accounted for by two individual proteins that are primarily only of nutritional value, casein and albumin.

### **Colostrum Fat.**

The milk fat in complete first milking colostrum is one of the most under-rated and misunderstood components by many companies that promote bovine colostrum for human consumption. There are all kinds of stories, none of which are ever substantiated with any scientific evidence that the fat in colostrum doesn't serve any purpose and/or

that having it there leads to faster deterioration of the product. Nothing could be further from the truth. In fact, one of the companies that removes the fat from what they call "colostrum" then adds a component of the fat back to their dried products. They claim that this makes their "colostrum" more digestible, which was one of the functions of the fat in complete colostrum in the first place. Casein is a nutritionally valuable complete protein that is broken down in the stomach to small peptides and amino acids so that they can be absorbed and used to build new muscle protein by forming a cottage cheese-like curd in the stomach. This occurs enzymatically in the newborn and the adult and the basis for the curd that forms is the fat in the colostrum. So without it, in addition to losing some significant biologically active substances that are associated with the fat, one loses most of the nutritional value of the casein. That is part of the reason why the fat content of colostrum increases with time after birth as the amount of casein increases in the secreted fluid. Mother nature doesn't waste much and has organized the components of colostrum and their changing pattern in an efficient way to maximize the benefits to the offspring that is going to receive it.

High quality first milking bovine colostrum will contain 20-30% milk fat.<sup>2</sup> The milk fat in colostrum is also a very important means to deliver some of its beneficial biologically active substances.<sup>1,3</sup> Dissolved in or associated with the fat in colostrum are vitamins A, D, E and K; steroid hormones; corticosteroids; some growth factors; and insulin. Lactose (milk sugar).

Approximately 10-15% of all of the solid material in high quality complete first milking colostrum will be lactose.<sup>2</sup> Lactose is extremely important to the calf as an immediate metabolic energy source when it is broken down to glucose and galactose by an enzyme (lactase) in the saliva and the stomach. Therefore, it makes good sense that the amount of lactose in transitional milk and mature milk increases as the calf develops rapidly during the early days of its life.

Since most people have the same enzyme (lactase) in their saliva and their digestive system, the lactose in the colostrum that they use as a dietary supplement can provide the same ready source of metabolic energy. However, there are "lactose intolerant" individuals who have problems digesting lactose because their body produces too little or none of the lactase enzyme. The amount of lactose in first milking colostrum collected within 6 hours after birth is about one-half of what it is at 12 hours after birth and one-third of what it becomes by 24 hours. Therefore, a high quality complete first milking colostrum collected within 6 hours after birth can be used as a dietary supplement by more people without potentially having them suffer the discomforts associated with lactose intolerance.

Other compositional considerations.

The following comparative facts about colostrum and milk further stress the value of a complete first milking colostrum in maximizing the health related benefits.<sup>1</sup>

Colostrum contains 10 times more vitamin A than milk.

Colostrum contains 3 times more vitamin D than milk.

Colostrum contains at least 10 times more iron than milk.

Colostrum contains more calcium, phosphorous and magnesium than milk.

The biologically active components.

The biologically active components in complete first milking colostrum can be divided into categories based upon the health aspect where they exert their greatest influence. In some cases the functions of these components can be clearly separated into such categories, while, in many cases, the dividing line is clouded. The major categories are the Immune Factors, the Growth Factors and the Metabolic Factors. It is very important to recognize that most of the very broad claims made by many suppliers of colostrum for human consumption about what these substances do are based upon very specialized studies in experimental animals and represent the company's interpretation of the results and not necessarily that of the original scientific investigator.