

SOLID AS A ROCK



another fine limestone product

**FEED-GRADE
CALCIUM
CARBONATE**



**The Feed Industry
Calcium Source**



ILC Resources

What is the Geological History of Limestone?

Limestone is an ordinary kind of sedimentary rock principally composed of calcium carbonate or combinations of calcium and magnesium carbonate. This sedimentary rock was formed millions of years ago and is composed primarily of shells and skeletons of plants and animals of marine origin. This fossiliferous calcium carbonate bearing material was gradually broken down by the abrasive action of sea agitation into sand-like fragments. They were then accumulated through deposition, layer on layer, to form in some instances massive beds of limestone.

What is Feed-Grade Limestone?

A large variety of calcium sources are available for application in the feed industry. However, the most common sources of supplemental calcium are in some form of limestone (Table 1). The two most fundamental types of limestone are *high calcium* (calcitic) and *dolomitic*. The Association of American Feed Control Officials (AAFCO) classifies *calcitic* or high calcium sources of high limestone in two categories. One is **calcium carbonate**, a product true to name which contains a minimum of 38% calcium (Ca). The other is **ground limestone**, an acceptable source of calcium carbonate, true to name and contains not less than 33% calcium (Ca). *Dolomitic stone* is a source of a mixture of magnesium and calcium carbonate and is categorized as either dolomitic limestone or magnesium limestone. **Dolomitic limestone** contains not less than 10% magnesium, whereas, **magnesium limestone** contains more magnesium than high calcitic but less than dolomite. Therefore, *limestone* is a very broad term referring to calcium mineral ingredient sources that may vary from 20–40% calcium. Most often, feed-grade limestone pertains to the **calcitic** sources.

Table 1. Typical Limestone Sources

	Calcium	Magnesium
Calcium Carbonate	38-40%	0.1-0.8%
Ground Limestone	33-37%	1-2%
Magnesium Limestone	25-32%	3-9%
Dolomitic Limestone	20-23%	10-13%

Other Sources of Calcium

Marble Dust	38%
Oyster Shell	38%
Aragonite	38%
Calcite	38%
Gypsum (calcium sulfate)	22%
Steamed Bone Meal	31%
Meat and Bone Meal	8-14%
Calcium Phosphates	
Monocalcium	15-18%
Dicalcium	9-22%
Defluorinated	31%

Are All Limestones Created Equal?

The real value of a feed-grade limestone is based on its calcium content. The purer the material, the more available it will be for animal utilization (Table 2). ILC Resources provides only high calcium limestone products to the feed industry. Our quality control program allows us to select the highest quality products.

Table 2. Comparative Biological Availability (B.A.) of Feed Grade Limestone Sources

Limestone Sources	B.A.
Calcium Carbonate	100%
Ground Limestone	90-95%
Magnesium Limestone	80%
Dolomite Limestone	53%

Can Particle Size Affect Performance?

Feed-grade limestone products, application and particle size information are shown in Table 3.

Over the years, ILC Resources has sponsored numerous studies to investigate performance. Research has shown that feed-grade limestone products of different particle sizes (5 to 1,180 microns) are equally effective in supplying calcium and influencing performance and digestion in

most poultry, swine and ruminant animals. However, in the case of laying hens, large particle limestone (1,400 to 5,600 microns) appears to be more effective than smaller granulations in producing eggs with acceptable shell strength and quality. Recent layer research has shown that limestone solubility properties can be used to select the appropriate particle size for layer application.

Table 3. Typical Feed-Grade Calcium Carbonate Products

Category	Feed Industry Application	Sieve Size (microns)	Sieve Size (US Screen)
Air-Separated (Powder)	Liquid Feed (Ruminants)	5-38	600-400
Pulverize (Powder)	Liquid and Dry Feed (All Species)	45-63	325-200
Fine (Granular)	Complete Feeds, Premixes and Base Mixes (All Species)	75-212	200-70
Medium (Granular)	Complete Feeds, Premixes and Base Mixes (All Species)	250-500	70-40
Coarse (Granular)	Complete Feeds Premixes and Base Mixes (All Species)	600-1180	30-16
Extra-Coarse (Granular) (Pulletsized)	Complete Feeds for Poultry (Layers)	1400-2000	14-10
Large (Granular) (Hensize)	Complete Feeds for Poultry (Layers)	2000-4000	8-3.5

How Should I Select the Particle Size I Need?

In general, the selection of a feed-grade limestone source should be based on mixing characteristics, compatibility with other feed components, application and quality and consistency traits. ILC Resources has a variety of products available to the feed industry to meet its many diverse applications.

Is Color An Important Indicator of Quality?

The coloration difference among limestones happens as a result of certain minerals present in very small quantities in the limestone and formation conditions over time. These influence the tint of the stone, thus altering its color. Consequently, the

color of the limestone and the possible change in color over time reveals more about its geological history than its quality. The calcium content is the best determination of quality and purity of a feed-grade limestone.

For Further Information on Feed-Grade Calcium Carbonate, Who Should I Contact?

ILC Resources has customer and technical service representatives ready to address your questions. We can provide you with up-to-date nutrition research information, help you select the appropriate product for your specific application, or simply answer any general questions you may have on feed-grade limestone.

