



Food Grade Calcium Hydroxide – “Lime”

Tortilla Industry Association, April 25, 2026

Presented by Daniel T. Menniti and Brendan Phillips
MLC – formerly **M**ississippi **L**ime **C**ompany



Refresher: Mississippi Lime — VitaCal® H — MLC



VITACAL® H
FOOD GRADE CALCIUM HYDROXIDE
(HYDRATED LIME)

CERTIFIED KOSHER - PAREVE



MANUFACTURED BY
MISSISSIPPI LIME COMPANY

VITACAL® H
FCC food-grade calcium hydroxide

CERTIFIED KOSHER - PAREVE



Manufactured by MLC

Agenda



- **What is Lime?**
- **How is lime made and supplied?**
- **Lime in nixtamalization**

Testing of various grades of lime:

- Nixtamalization
- Food-grade specifications



Lime Processes Overview



Mining

Chemical grade limestone (calcium carbonate) is mined, crushed, and processed.



Calcining

Limestone is heated until conversion to quicklime (calcium oxide) and further processed and refined.

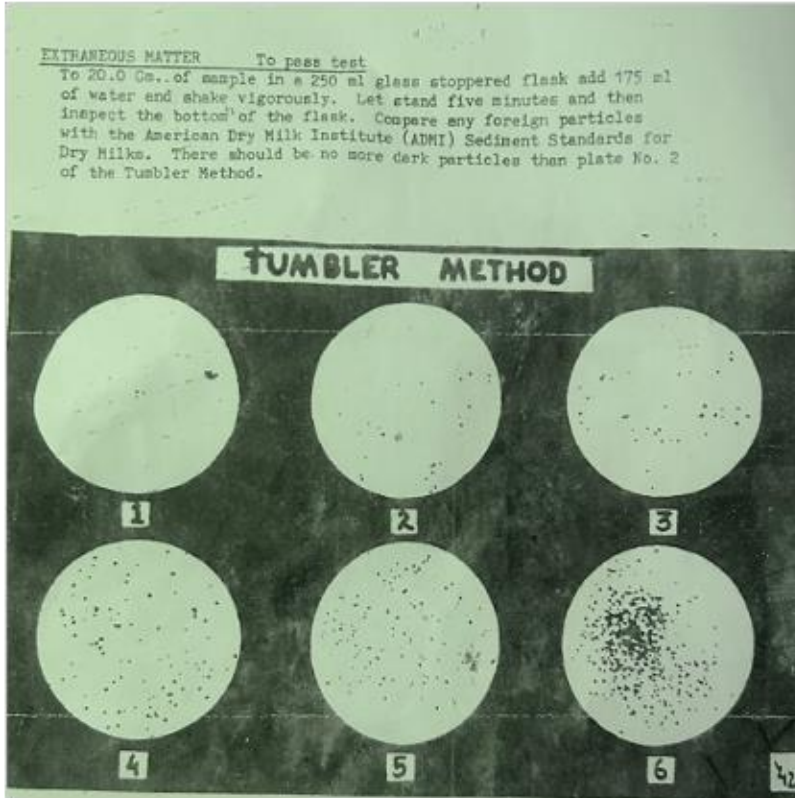


Hydration

Quicklime is reacted with water and converted into hydrated lime (calcium hydroxide), then processed and refined.

“Lime” is a catch-all term for the versatile mineral

Extraneous Matter Test – contaminants in lime (calcium hydroxide) affect color of masa and tortilla



VitaCal H[®](0)



Calcium hydroxide B (5)

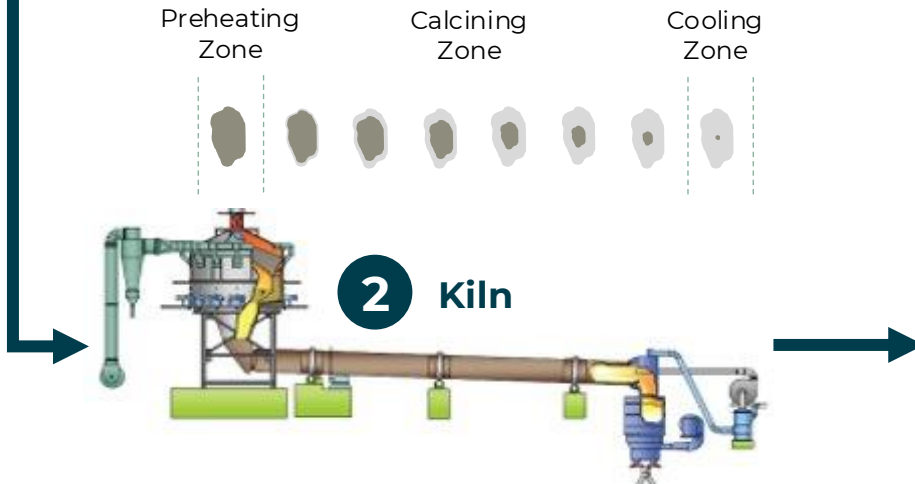


There are process considerations that will lead to extraneous matter (contaminants)

Quicklime Production (Calcium Oxide)



1 Drilling & Blasting
Limestone
(Calcium Carbonate)



3 Quicklime (Calcium Oxide)



Hydrate Production(Calcium Hydroxide)



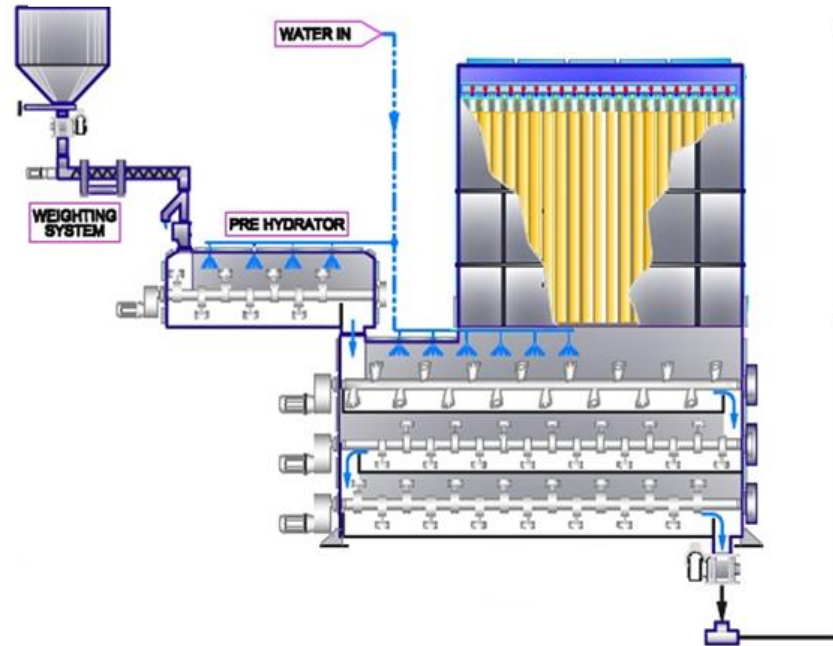
Calcium hydroxide refinement plays a key role in lime efficiency in the nixtamalization process



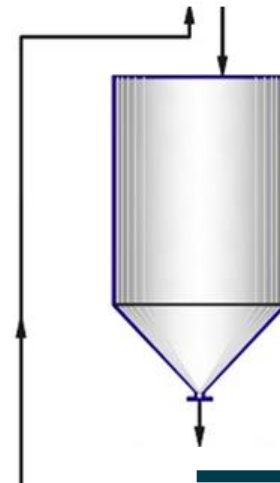
1 Quicklime (Calcium Oxide)



2 Hydration



3 Refinement



4

Hydrated Lime (Calcium Hydroxide)



Supply Chain Considerations



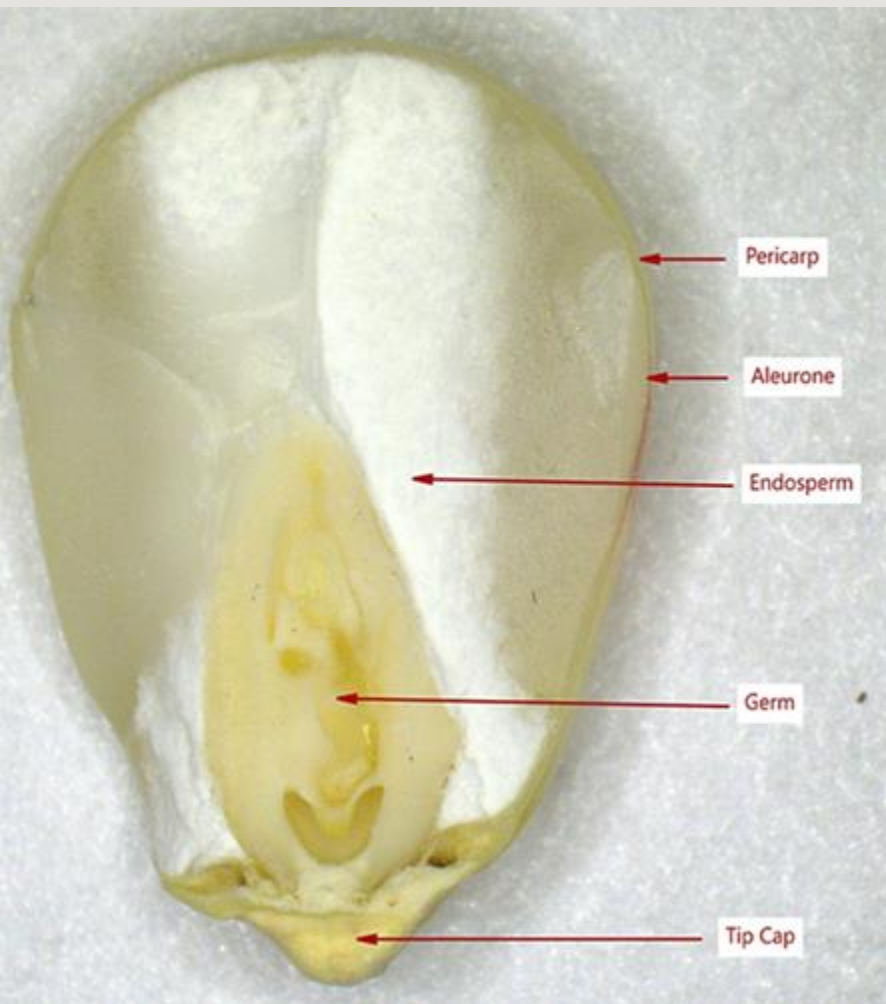
- **Inventory Considerations**

- Keep product Best Used-By Date in mind
- Keep unused product protected from air
- Climate controlled storage is best practice for bagged material

- **Delivery Options:**

- Bulk
- Super Sacks
- 50 lb. Bags
- Calcium Hydroxide Slurry

Nixtamalization and the Role of Lime



A traditional Mesoamerican technique that involves cooking corn in a calcium hydroxide solution to remove the pericarp and to improve processibility, digestibility and nutritional value for human consumption.

Cooking and steeping dried maize kernels in an alkaline lime solution (pH 11 – 12.4) results in:

- An increase in pH which **dissolves the pericarp and hydrolyzes** internal components
- Promotes **partial gelatinization** of starch
- Improves **workability** of the masa
- Increases **calcium content and reduces mycotoxins**
- Influences **taste, color, texture, and pH of masa/final product**

Lime in Nixtamalization

VitaCal® H in a nixtamalization process to produce corn masa-based snacks

COOKING

- Dry hydrated powder form at 1:100 (wt:wt) ratio of dry corn feed. (e.g. 1000 lbs of dry corn + 10 lbs of calcium hydroxide)
- Slurry at 30% solids → pumped to the cook kettles.

Cooking needs to be above 140°F (180°F typical) for ≈15-60 minutes

STEEPING

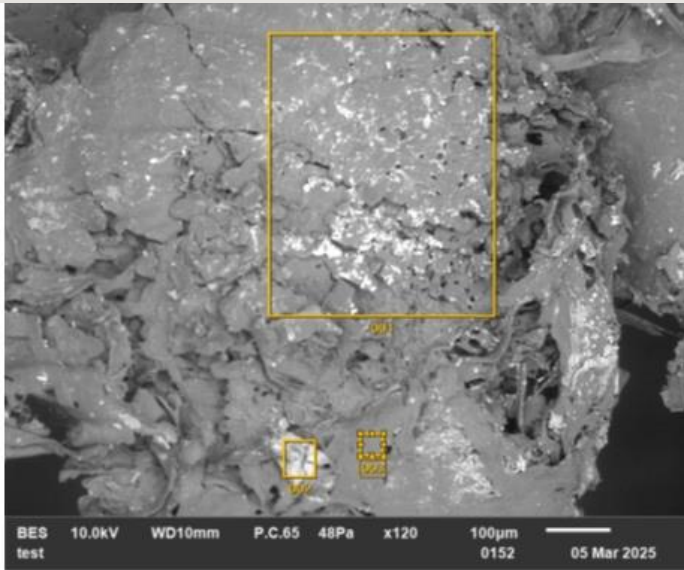
- Transferred to a soaking vessel where the corn continues to steep 8-12 hrs. below 140 °F



Scanning Electron Microscopy (SEM)



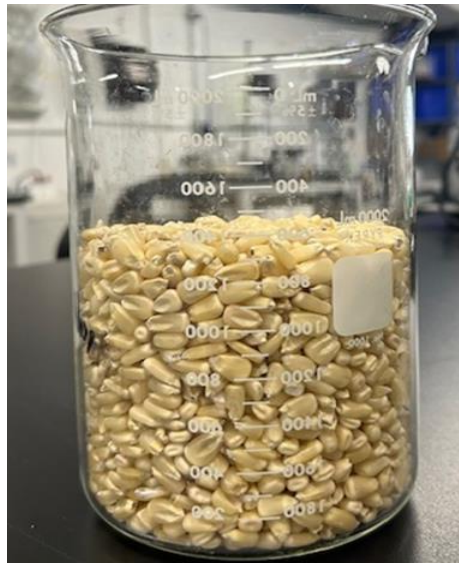
VitaCal 1% Germ



Corn Type	Pericarp/Aleurone	Endosperm
Raw Corn Kernel		
Nixtamalized Corn Kernel		

	C	O	Na	Mg	Al	P	K	Ca
001	48.07	48.12			0.26		0.73	2.82
002	36.28	40.76	0.13	0.46	0.33	7.94	1.54	12.56
003	52.75	44.48			0.22	0.21	0.48	1.87
Average	45.70	44.45	0.13	0.46	0.27	4.07	0.92	5.75

Nixtamalization Process Data (Quality)



“Raw” Dried 2.5lbs.



VitaCal H (4.2 lbs.) Calcium Hydroxide B (3.8 lbs.)

- VitaCal® H calcium hydroxide provided **10% more nixtamalized corn** by weight compared to calcium hydroxide B at the same dosage.
- Calcium hydroxide B requires **25% more lime** to achieve same results

Lime Cook Product	Starting pH	Cooking pH	Steeping pH	End pH	Nixtamal wc (%)	Masa Dough pH	Tortilla pH
Water Cooked Corn (0% Lime)	6.7	6.2	6.2	6.1	40.18%	6.10	6.00
VitaCal H (1% Lime)	12.3	11.9	11.9	11.9	48.53%	9.00	8.50
Calcium Hydroxide B (1% Lime)	11.9	11.7	11.7	11.5	42.57%	6.95	7.10

A higher quality lime product results in better products!

VitaCal® H Concentration Effects



Quality and Quantity matter and can influence:

- **Taste**
- **Shelf-life**
- **Color**
- **pH** of tortilla

The amount of lime and the quality of the lime influence the end product.



pH: 7.09

8.5

9.8



0.5% Lime

1% Lime

6% Lime

FSSC certified for food safety assurance

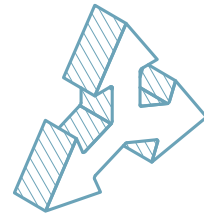


Process-based approach to food safety management, providing continuous assurance



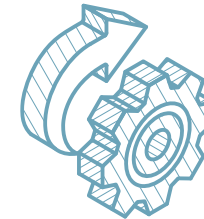
**Recognized
Globally**

Accepted by key accreditation bodies around the world, including the Global Food Safety Initiative (GFSI)



**Integrated and
Comprehensive**

Incorporates and builds upon ISO 22000, HACCP, PAS 220 PRPs, as well as integrating with other important certifications and schemes, such as ISO 9001

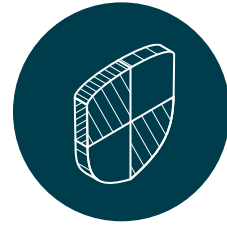


**Process-Based for
Continuous
Compliance**

Certifies the management process, which promotes continuous compliance and safety assurance through rigorous auditing, monitoring, and controls

Rigorous standards, certifications, and protocols to protect the quality and safety of food-grade products are essential, but incomplete without FCC compliant material.

Food-grade considerations when choosing a lime product for nixtamalization



Meets Food-Grade Standards

- FDA registered production facilities
- FSC 22000/GFSI recognized Quality Control System
- **VitaCal® H meets FCC 14th edition specifications**
- **Remember, FDA registration does not guarantee food grade compliance**



Delivery Demands

- Food grade packaging
- Food grade logistics

Calcium hydroxide supplied for food use shall meet FDA regulatory requirements for direct food additives and shall conform to the current FCC monograph, FCC 14th edition for purity.

Comparison of various lime products for FCC Monograph



FCC SPECIFICATIONS (14th Edition)

Assay Ca(OH) ₂	95.0% - 100.5%
Carbonate	Passes Test
Magnesium & Alkali Salts	4.8% max
Fluoride	50 ppm max
Lead	2 ppm max
Arsenic	3 ppm max
Acid Insoluble Substances	0.5% max

Lab testing of fluoride levels in calcium hydroxide products

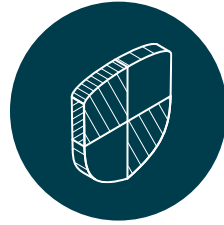
FCC Parameter	VitaCal H	Calcium Hydroxide B	Calcium Hydroxide C	Calcium Hydroxide D
Fluoride	40 ppm	58 ppm	139 ppm	121 ppm

What is important in choosing a lime product for nixtamalization? Consistency is the Key.



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Performance

- Purity – Ca(OH)₂
- Low impurities – meets FCC 14th Edition
- Particle size distribution – consistent reactivity
- Surface Area



Production and Supply Chain

- Consider fuel source (natural gas or coal/pet coke)
- Reliability of supply
- Legacy of food grade supply for over fifty (50) years

Contact Us



Daniel T. Menniti

**Global Business & Sales Manager —
Specialty Market**

DTMenniti@mlc.com

+1 412.979.8030



Scan and add me
to your address book



+1 314.543.6300 or 800.437.5463



sales@mlc.com



www.mlc.com

Appendix

