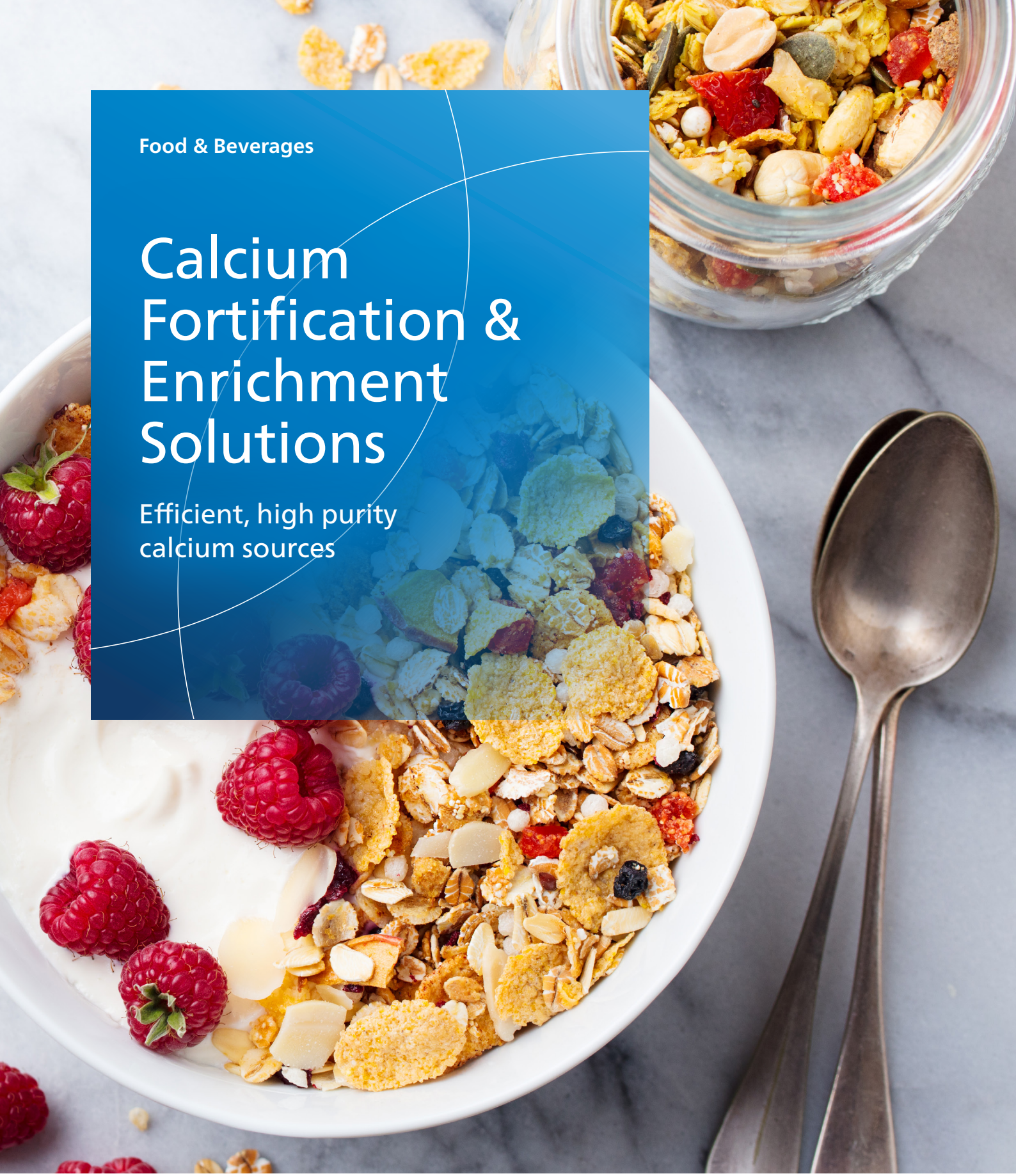


Food & Beverages

Calcium Fortification & Enrichment Solutions

Efficient, high purity calcium sources

THINKING OF TOMORROW

Why choose Omya calcium carbonate?

Omya offers food manufacturers an ideal solution for food fortification, providing high calcium content in a completely natural, tasteless, and odorless form. This cost-effective ingredient is easily incorporated into formulations due to its tailored particle size distribution and low carbon footprint.

Less required in the formulation

Omya's calcium carbonate has approximately 40% elemental calcium content, higher than most other sources of calcium. This high purity, combined with tailormade particle properties, means less mineral mass is required to meet the recommended daily intake, compared with other calcium sources. Additionally, the crispness of extruded cereals can be improved by up to 45%.

Overview of calcium content and solubility of different calcium salts

	Calcium content	Solubility (mM/l)*	Fractional absorption**
Calcium carbonate	40	0.14	0.296 ± 0.054
Tricalcium phosphate	39	0.97	0.252 ± 0.130
Calcium citrate	21	7.3	0.242 ± 0.049
Calcium citrate malate	30	80	0.363 ± 0.076

* Solubility in water at neutral pH, expressed as millimoles/liter
** Determined in women using isotopic tracer techniques on test loads of 200—300 mg calcium
Weaver, Connie M., International Dairy Journal, 8 (1998), 443-449

Good absorption by the body

Numerous studies* have demonstrated the effective absorption of calcium carbonate, particularly when taken with food, as it reacts with the acid in the stomach. Independent of its low solubility in water, calcium carbonate delivers as good bioavailability as other less efficient, in terms of both elemental content and cost, calcium sources.

* Yongdong et al (2005): Calcium bioavailability of calcium carbonate fortified soymilk is equivalent to cow`s milk in young women
Weaver et al (2002): Absorption of calcium fumarate salts is equivalent to other calcium salts when measured in the rat model

Fortification challenges

- Maintaining taste and quality
- Impact on shelf life
- Demand for natural ingredients
- Maintaining taste and mouthfeel

A neutral ingredient

Calcium carbonate is tasteless and odorless, so it will not affect the flavor profile of foods and beverages. Its particle size distribution can also be tailored to prevent any impact on mouthfeel.

Cost-effective in the formulation

Omya's global availability and state of the art processing methods make our calcium carbonate one of the most cost-effective sources of calcium on the market. Our products improve the processability and texture of some foods and our range of particle properties helps manufacturers meet formulation needs for efficient processing.
Omya calcium carbonate, with its high elemental calcium content, enables manufacturers to match calcium claims with lower volume, further increasing its cost-competitiveness compared with other calcium sources (see table with elemental calcium content page 2).

Lower carbon footprint

Natural calcium carbonate has a lower carbon footprint compared with other calcium sources, because of its natural abundance and the simplicity of extraction and processing. The carbon footprint of natural ground calcium carbonate is more than 10 times less than precipitated calcium carbonate.

Certified and approved

Omya's products are sourced from the highest purity deposits and are manufactured according to required regulations and following the highest standards:

- Meeting JECFA E170, US-FCC for "Calcium carbonate" and China Food Safety Standard requirements
- Manufactured according to HACCP principles
- Certified ISO 9001, ISO 14001, ISO 45001, ISO 50001, FSSC 22000
- Halal and kosher

Calcium carbonate in snacks and cereals

Calcium carbonate is widely used as a fortifying agent in snacks and cereal products to boost nutritional value. However, it also provides other benefits, such as improved processability and texture in a broad range of sweet and savory snacks, including breakfast cereals and extruded inclusions.

Omya's calcium carbonate acts as a nucleating agent, enhancing the quality of extruded food products. As water vapor is released, gas bubbles form on the surface of its well-distributed particles, helping to maintain product structure while allowing controlled formation of sugar or starch crystals. The particle size distribution of Omya calcium carbonate is tailored to offer the optimal quantity and homogenous distribution of fine gas bubbles, improving expansion and crispness. Extruded food products containing Omya Calcipur or Omya-Cal show improved crispness and less stickiness. The snack surface is rough but – thanks to Omya Calcipur – more even, leading to a homogenous appearance, especially at the cut edges.

Calcium carbonate increases the crispiness of extruded cereals

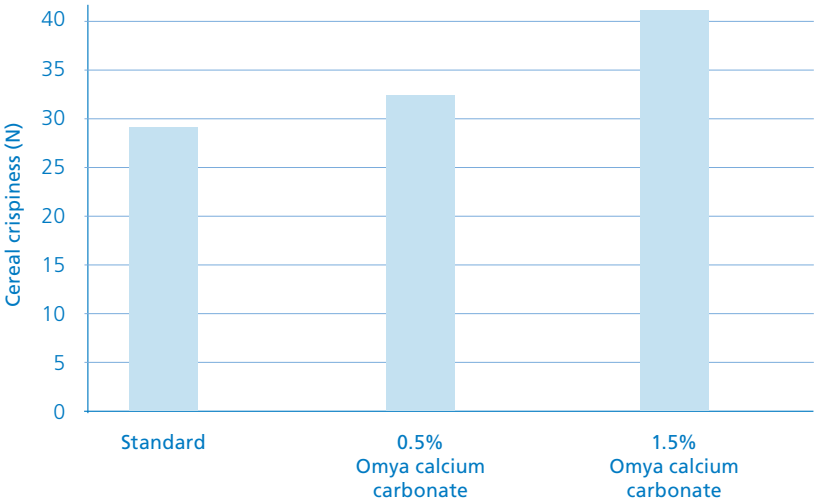
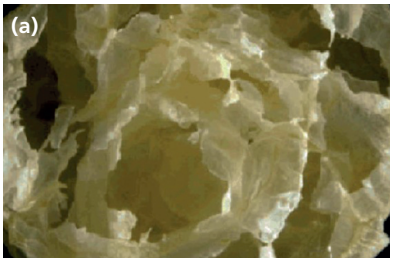


Figure 1: Calcium carbonate increase the crispness of extruded cereals

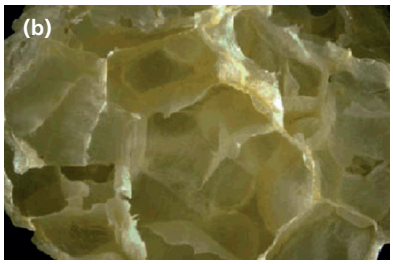
The crispiness is expressed as the number of peaks (N) measured by an Acoustic Envelope Detector (AED) attached to the texture analyzer.

Key Benefits

- Enhanced nutritional profile
- Improved crispiness, mouthfeel and appearance
- Better processability
- Tailor made particle size



Snack without extrusion aid



Snack with 0.5% Omya Calcipur

Figure 2: Calcium carbonate, a powerful nucleating agent for extruded products

Pore size and distribution in an extruded cereal (a) without and (b) with Omya calcium carbonate.

Product offer

Product	Material type	Country of origin	Median particle size D50% (µm)	Recommended usage level
Omya Calcipur® 90-KP	Natural calcium carbonate	Turkey	2.2	0.5-1.5
Omya Calcipur® 2-OG		France	3.0	
Omya-Cal® FG4-AZ		USA	3.5	

Calcium carbonate in non-dairy drinks

Omya's calcium carbonate is an ideal choice for calcium enrichment in non-dairy drinks, providing a suitable calcium source for consumers who avoid or cannot consume dairy. The addition of Omya calcium carbonate enhances the nutritional profile of a wide range of non-dairy drinks, including almond, soy, oat and rice, without affecting their texture or taste.

Omya provides tailor-made particle sizes to allow seamless incorporation, high redispersion capacity and slower sedimentation in the formulation, ensuring the calcium content is the same in every serving.

Calcium redispersion in almond milk

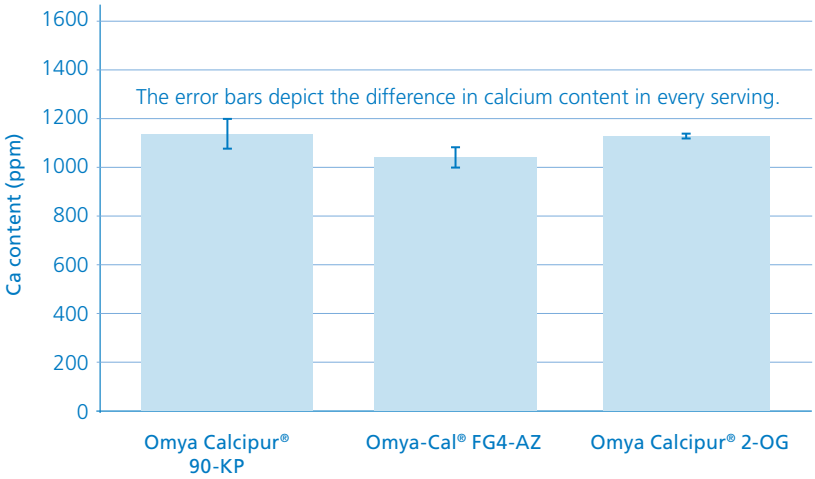


Figure 3: Calcium redispersion in almond milk

Calcium content measured by titration in almond milk (250 ml serving size).

A single serving of almond milk containing Omya's calcium carbonate provides a consistent amount of calcium throughout the full serving.

Key Benefits

- Neutral taste
- Smooth texture
- Tailor made particle size
- Slower sedimentation
- Same calcium content in every serving (high redispersion capacity)

Stability after 24 hours

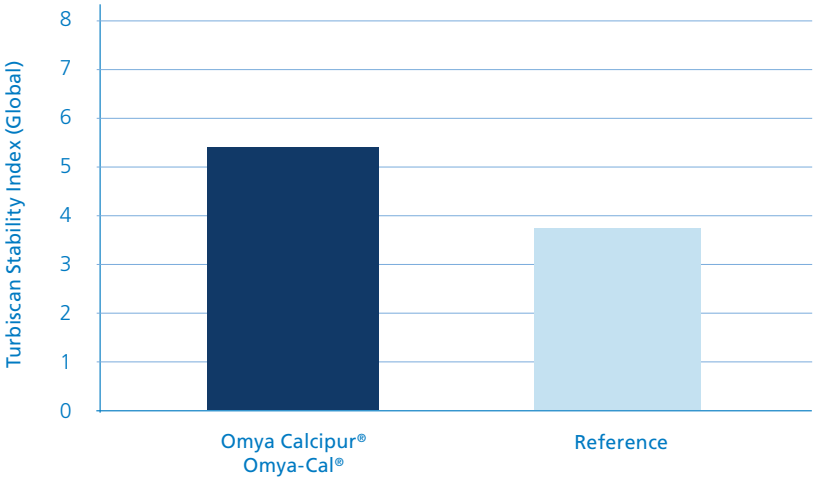


Figure 4: Almond milk stability within one day

Stability index measured by Turbiscan of almond milk with and without calcium carbonate. The samples were produced in our UHT line and the stability measured immediately after production for 24 hours at 25° C. The suspensions were both stable (TSI values below 10).

Product offer

Product	Material type	Country of origin	Median particle size D50% (µm)	Loose bulk density (g/ml)	Recommended usage level (g/L)	
					Non-dairy drinks	Dairy drinks
Omya Calcipur® 90-KP	Natural calcium carbonate	Turkey	2.2	0.54	3	qs
Omya Calcipur® 2-OG		France	3.0	0.69		
Omya-Cal® FG4-AZ		USA	3.5	0.58		

Omya International AG, Baslerstrasse 42, CH-4665 Oftringen

Source: Omya International (2024/11) EN

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