

FIBERSOL-2™

DIGESTION RESISTANT MALTODEXTRIN

A VERSATILE FIBER FOR CONSUMERS AND FORMULATORS

FIBERSOL-2™ DIGESTION RESISTANT maltodextrin is great for consumers because it's a soluble dietary fiber that doesn't act like one. It doesn't affect the taste of foods and doesn't leave clear or transparent beverages cloudy or gritty. But its functionality isn't limited to consumers. Fibersol-2 digestion resistant maltodextrin functions for formulators too!

Fibersol-2 digestion resistant maltodextrin is multi-functional and can be used in countless applications, so it's perfect for formulators, as well as consumers. In addition to rapid dispersion, this fiber is clear or transparent in solution, highly soluble, and stable under virtually all conditions. Fibersol-2 digestion resistant maltodextrin is also a very low viscosity, low hygroscopicity, and low sweetness fiber source with water-binding and body- and texture-improving characteristics.

WHY FIBERSOL-2™ DIGESTION RESISTANT MALTODEXTRIN?

- Dietary fiber (90% min. DSB)
- High solubility
- Rapid dispersion
- Clear, transparent solution
- No inherent or added flavor
- Very low viscosity
- Water binding
- Improves body/texture
- Low hygroscopicity
- Low sweetness
- Acid, heat/retort, and freeze/thaw stable

Fibersol-2 is a trademark of Matsutani Chemical Industry Co., Ltd.

Now you can increase the dietary fiber content—and nutritional value—of practically any food, beverage, or supplement. In fact, you can meet your customers' recommended daily allowance of fiber—25 grams—by using Fibersol-2 digestion resistant maltodextrin in your applications. **And even at high levels, Fibersol-2 digestion resistant maltodextrin doesn't affect the taste or interfere with mineral or calcium absorption—so it's an excellent fiber source for consumers of any age!** Fibersol-2 digestion resistant maltodextrin can be incorporated into all types of beverages, processed foods, cultured dairy products and frozen dairy desserts, confections, dietary supplements in every form, and much more!

Meet consumers' needs for a great-tasting fiber source and your needs for an easy-to-use fiber ingredient. As with all ADM ingredients, Fibersol-2 digestion resistant maltodextrin is backed by a technical support team that understands ingredient technology and is committed to providing application solutions. You'll find more information on Fibersol-2 digestion resistant maltodextrin inside!

Fibersol-2™
Digestion Resistant Maltodextrin



FOOD
INGREDIENTS

BAKING &
CEREALS

BEVERAGES

CANDY &
CONFECTIONERY

DAIRY

MEAT PRODUCTS

OTHER PROCESSED
FOODS

SNACK FOODS



ADM offers more than 500 high-quality ingredients, and the skill to combine them with any food or beverage. **RESOURCEFUL BY NATURE™**

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THE FACTS ABOUT FIBERSOL-2™ DIGESTION RESISTANT MALTODEXTRIN

Fibersol-2™ digestion resistant maltodextrin is a sprayed-dried powder produced by a proprietary method of controlled enzymatic hydrolysis. This concentrated form (90% minimum, dry weight basis) of soluble dietary fiber is considered “natural” by most industry definitions. It has been approved as GRAS (generally recognized as safe) by the Food and Drug Administration and certified kosher and pareve by the Orthodox Union.



There are a variety of functional, physical, and sensory attributes that Fibersol-2 digestion resistant maltodextrin will bring to your food and beverage applications.

KEY APPLICATIONS

- Beverages (all types)
- Reduced-, low-, no-fat foods
- Reduced-, low-calorie foods
- Confections
- Fiber supplements and enrichments
- Baked goods
- Ready-to-eat and hot cereals
- Nutritional foods
- Snack foods
- Processed meats
- Cultured dairy foods
- Frozen dairy desserts
- Meal replacement foods
- Dietary supplements
- Spreads
- No-sugar-added foods
- Dry mixes
- Soups, sauces, dressings
- Medical foods
- High-intensity tabletop sweeteners

A FUNCTIONAL FIBER IN EVERY WAY

SOLUBLE DIETARY FIBER: 90% minimum DSB soluble dietary fiber (in accordance with AOAC method #2001.03) and one of the most economical fiber sources available. Fibersol-2 digestion resistant maltodextrin, analytically and nutritionally, meets the definition of dietary fiber for nutrition labeling purposes, as published by the American Association of Cereal Chemists (AACC) and proposed by the National Academy of Sciences (NAS).

HIGH SOLUBILITY: Totally soluble in water up to 70% (w/w) at 20° C, allowing it to be solubilized in small amounts of water as needed.

RAPID DISPERSION: Readily dispersible in water and highly compatible with dry drink mix applications, including simple and more complex co-dried or dry blended mixes.

CLEAR, TRANSPARENT SOLUTION: At typical use levels, it yields clear, transparent solutions that are near water-like in performance. This allows for ultimate formulation versatility.

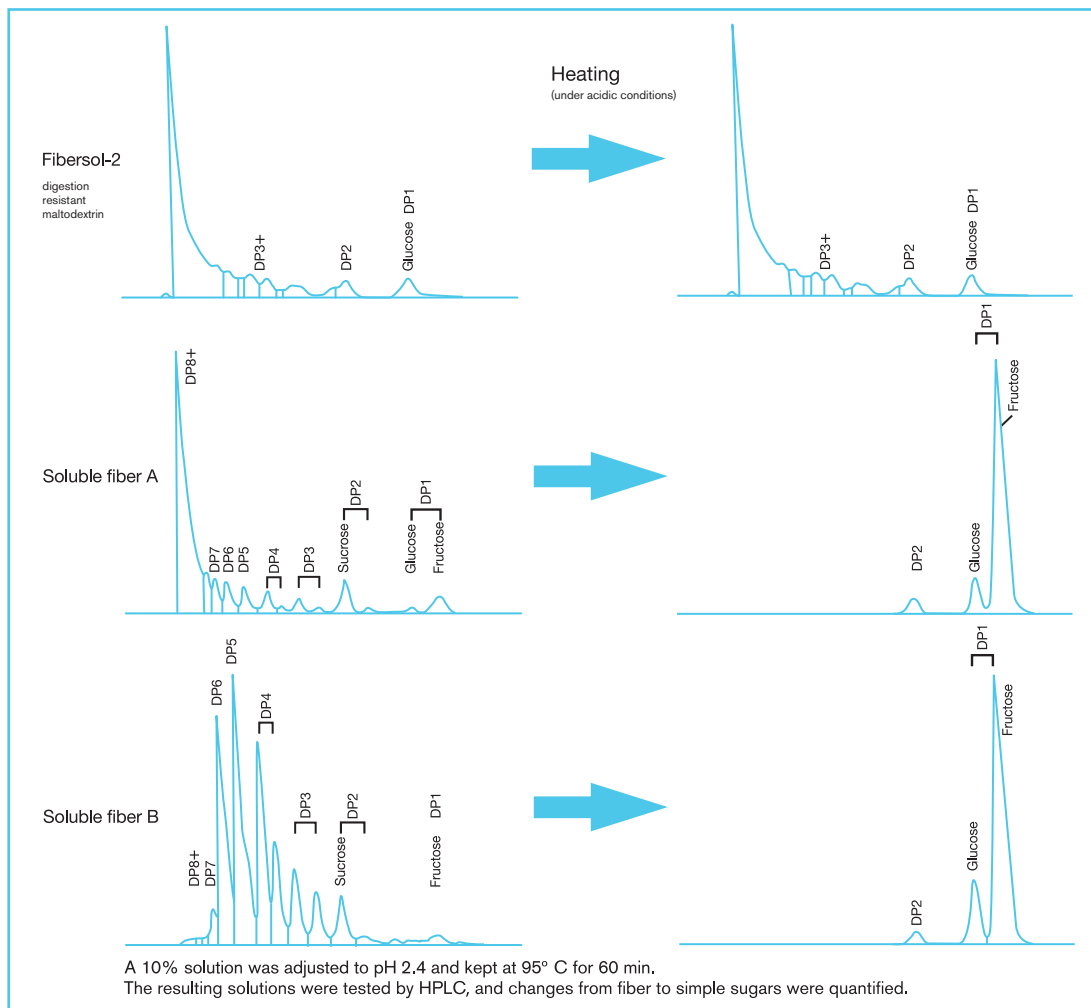
NO INHERENT OR ADDED FLAVORS: Fibersol-2 digestion resistant maltodextrin adds no flavor or odor, making it suitable for use in even delicately flavored applications.

IMPROVES FLAVOR, PERFORMANCE OF HIGH-INTENSITY SWEETENERS: Modifies and improves the sweetness and aftertaste performance of many high-intensity sweeteners, allowing for flavor, sweetness, and mouthfeel improvements to a variety of low-calorie foods.

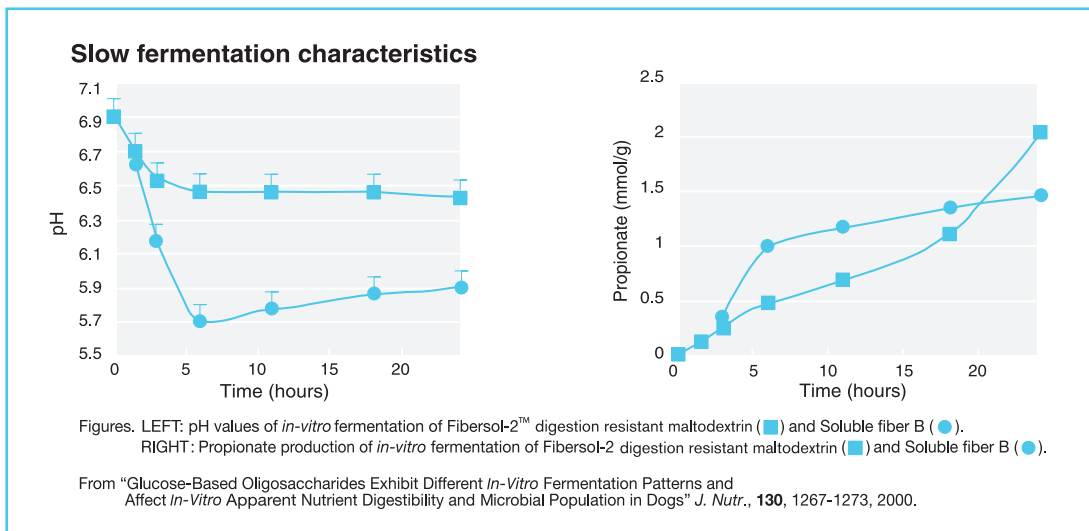
LOW SWEETNESS: Has essentially no sweetness of its own. Sweetness less than 10% of sucrose is typical. Can be used in many applications where additional sweetness is undesirable.

ACID AND HEAT/RETORT STABLE: Stability to acid and heat/retort processing—including stability in high acid, hot filled, aseptic, or retorted products like juices, sauces, puddings, fluid milks, and sports drinks—is unique. It retains its dietary fiber characteristics and function across process and post-process distribution conditions.

Acid/heat stability of Fibersol-2 digestion resistant maltodextrin as compared to other soluble fiber sources



In-vitro fermentation of Fibersol-2™ digestion resistant maltodextrin



SLOW FERMENTATION: Fibersol-2™ digestion resistant maltodextrin is fermented slowly, producing less acid and gas than most soluble dietary fibers, thus avoiding undesirable side effects to consumers.

SUPERIOR FREEZE/THAW STABILITY: Flavor, function, and performance of dietary fiber content are stable to repeated freezing and thawing when stressed due to distribution abuse or when used in a variety of frozen foods.

VERY LOW VISCOSITY: A precise and extremely low viscosity (15 cps, 30% solution at 30° C), allowing use rates in excess of 10% without direct impact on the mouthfeel, flavor, and other sensory performance requirements.

LOW HYGROSCOPICITY: Very low tendency to pick up moisture from the air. This makes for ease in handling and delivery to point of use, can effectively protect dry blends with other more hygroscopic ingredients.

BINDS WATER: Also releases bound water easily, adding perceived moistness to a variety of applications including low water activity products.

RESISTS BROWNING: Does not actively participate in non-enzymatic Maillard-type browning. Although its D.E. designation is similar to 10 D.E. maltodextrin, Fibersol-2 digestion resistant maltodextrin is more stable to non-enzymatic browning than 10 D.E. maltodextrin.



THE SCIENCE BEHIND FIBERSOL-2 DIGESTION RESISTANT MALTODEXTRIN

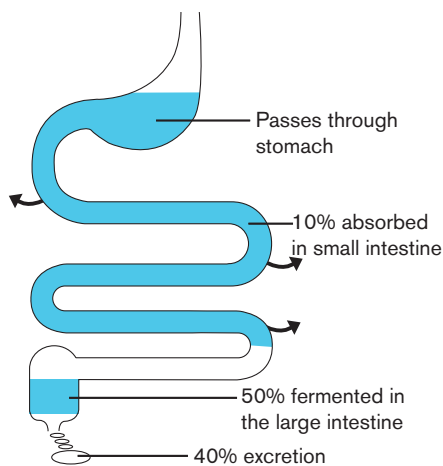
Fibersol-2 digestion resistant maltodextrin is produced by a proprietary process to purposefully rearrange cornstarch molecules to convert a portion of normal alpha -1,4- glucose linkages to random 1,2-, 1,3-, and 1,4- alpha and beta linkages. The human digestive system effectively digests only alpha -1,4- linkages. Therefore, other linkages created are resistant to digestion, so they are not absorbed in the small intestine and are passed on to the large intestine. Fibersol-2 digestion resistant maltodextrin is partially fermented in the large intestine. The fractions that aren't used are excreted.

NUTRITIONAL EFFICACY OF FIBERSOL-2 DIGESTION RESISTANT MALTODEXTRIN

More than 10 years of nutritional feeding studies in animals and humans worldwide as described by Ohkuma & Wakabayashi in *Advanced Dietary Fibre Technology*, 2001, have shown the direct, or indirect, impact of Fibersol-2 digestion resistant maltodextrin's bioavailability on a number of functions. Its pre-biotic effect on good intestinal health helps maintain healthful serum cholesterol, serum triglycerides, blood glucose levels, regular laxation, and levels of intestinal microflora.



As a water-soluble fiber, Fibersol-2 digestion resistant maltodextrin can effectively promote the growth of a variety of beneficial bacteria (naturally occurring or ingested as pro-biotics) in the colon. In promoting the growth of beneficial bacteria, Fibersol-2 digestion resistant maltodextrin indirectly reduces the presence of undesirable bacterial species. Additionally, secondary and tertiary nutritional benefits from fermentation byproducts such as short chain fatty acids can add to maintaining good intestinal and overall health.



FIBERSOL-2 DIGESTION RESISTANT MALTODEXTRIN NUTRITIONAL INFORMATION

<i>Nutrient</i>	<i>Per 100 grams of ingredient</i>
Total Calories	380 Kcal
Calories from Fat	0 Kcal
Calories from Saturated Fat	0 Kcal
Total Fat	0 g
Saturated Fat	0 g
Polyunsaturated Fat	0 g
Monounsaturated Fat	0 g
Cholesterol	0 mg
Sodium	1 mg
Potassium	0 mg
Total Carbohydrate	95.0 g
Dietary Fiber	90.0 g
Soluble Fiber	90.0 g
Insoluble Fiber	0 g
Sugars	5.0 g
Sugar Alcohol	0 g
Other Carbohydrate	0 g
Protein	0 g
Vitamin A	0 IU
Vitamin C	0 mg
Calcium	0 mg
Iron	0 mg

OTHER ESSENTIAL VITAMINS AND MINERALS (PER 100 GRAMS)

Thiamine	0 mg
Riboflavin	0 mg
Niacin	0 mg
Vitamin D	0 IU
Vitamin E	0 IU
Vitamin B-6	0 mg
Folic Acid	0 mg
Vitamin B-12	0 mg
Phosphorus	0.48 mg
Iodine	0 mg
Magnesium	0.07 mg
Zinc	0 mg
Copper	0.01 mg
Biotin	0 mg
Pantothenic Acid	0 mg

TECHNICAL, LABELING, AND STORAGE

PHYSICAL CHARACTERISTICS

Color: Off-white powder; clear, transparent in 10% solution; resists both enzymatic and non-enzymatic browning

Flavor: No flavor, clean

Solubility: Water soluble up to 70% (w/w) at 20° C

Dispersibility: Excellent

Hygroscopicity: Very low

Stability: Acid, heat/retort processing, and freeze/thaw stable

Viscosity: Very low; 15 cps, 30% solution at 30° C

Sweetness: Low, no sweetness (10% of sucrose at 30% T.S.)

Bulk density: Approx. 0.48 g per ml (30 lbs. per cubic foot)



TYPICAL CHEMICAL PROPERTIES

Water-soluble dietary fiber*: 90% minimum DSB (in accordance with AOAC method #2001.03)**

Moisture: 5% maximum

Protein: None

Fat: None

Ash: 0.2% maximum

DE: 8-12.5

Acidity: pH 4.0-6.0

Calories: 4.0 calories per g (U.S. CFR)

Carbohydrate profile (% of total carbohydrate)

DP1: 1.5%

DP2: 2.5%

DP3: 4.0%

DP4-6: 12.0%

DP7+: 80.0%

MICROBIOLOGICAL PROPERTIES

Standard plate count: Less than 300/g

Yeast/mold: Less than 100/g

Coliform: Negative

E. coli: Negative

Salmonella: Negative

Coagulase positive staph: Negative

INGREDIENT STATEMENT

Digestion Resistant Maltodextrin

Resistant Maltodextrin

Maltodextrin

These statements may be modified with (Fibersol-2™ fiber), (soluble dietary fiber), (dietary fiber), (fiber), etc.

PACKING AND STORAGE

Fibersol-2 digestion resistant maltodextrin is packaged in 50 lb. (22.7 kg) bags and 475 kg bulk totes. Keep Fibersol-2 digestion resistant maltodextrin stored in a cool, dry place, and its shelf life can exceed 18 months.

*Fibersol-2 digestion resistant maltodextrin is a rich source of water soluble dietary fiber. This is consistent with both the American Association of Cereal Chemists' and the Food and Nutrition Committee of the National Academy of Sciences' (NAS) definitions of dietary fiber. In both cases, Fibersol-2 digestion resistant maltodextrin is classified as "resistant maltodextrin," and in both cases, "resistant maltodextrin" is classified as dietary fiber.

**In April 2001, AOAC formally approved analytical methodology ("Determination of Total Dietary Fiber and Resistant Maltodextrin in Select Foods by Combination of Enzyme-Gravimetric and LC," AOAC method #2001.03), which measures digestion resistant maltodextrin.



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FIBERSOL-2™ DIGESTION RESISTANT MALTODEXTRIN

FIBERSOL-2™ SOLUBLE FIBER						
PRODUCT	WATER SOLUBLE DIETARY FIBER*	SOLUBILITY	COLOR IN SOLUTION	CERTIFICATION	CHARACTERISTICS	APPLICATIONS
<i>Fibersol-2</i>	90%* minimum**	Water, up to 70% (w/w) @ 20° C	Clear, colorless	GRAS as maltodextrin Kosher and parve by O.U.	No inherent or added flavor, high solubility, rapid dispersion, very low viscosity, low sweetness; acid, heat/retort, and freeze/thaw stable	Beverages (all types), nutritional bars, fiber supplements and enrichments, baked goods, cereals (RTE and hot), dairy foods, and dry mixes

*Meets criteria for fiber.

**AOAC Official Method 2001.03—Total Dietary Fiber in Foods Containing Resistant Maltodextrin.