



Fibersol-2

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**Unique Soluble Dietary Fiber**

# Fibersol-2

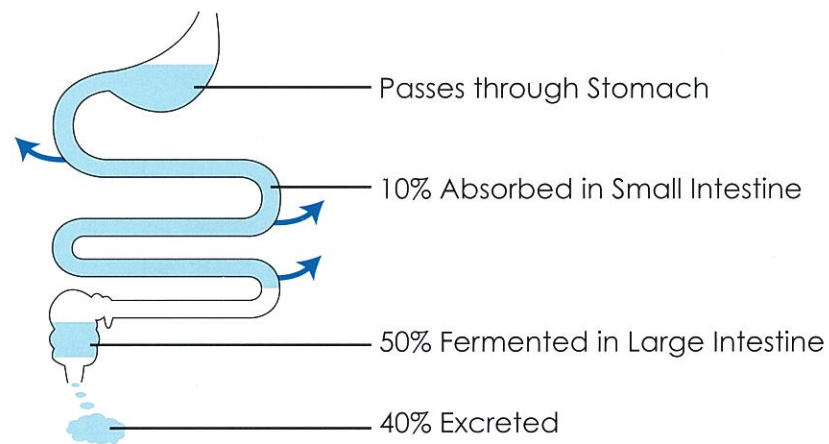
Fibersol-2 is a unique soluble dietary fiber produced from starch by the combination of dextrinization and enzymatic treatments.

Fibersol-2 has well-developed branched chemical structure composed of not only 1-4 and 1-6 but also 1-2 and 1-3 glucosidic linkages.

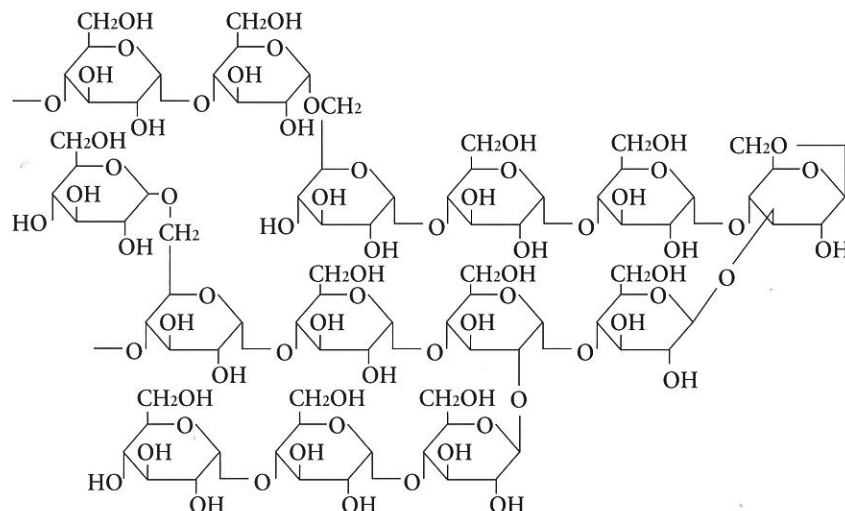
The branched structure is resistant to human digestive enzymes and not absorbed in the small intestine.

Therefore, Fibersol-2 reaches the large intestine, and then partially fermented with the residual unutilized/ excreted.

## Internal Utilization

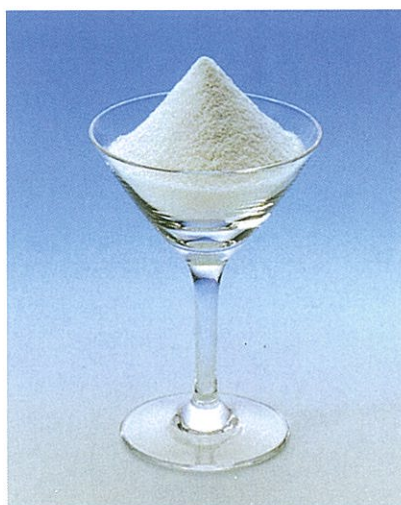


## Chemical Structure



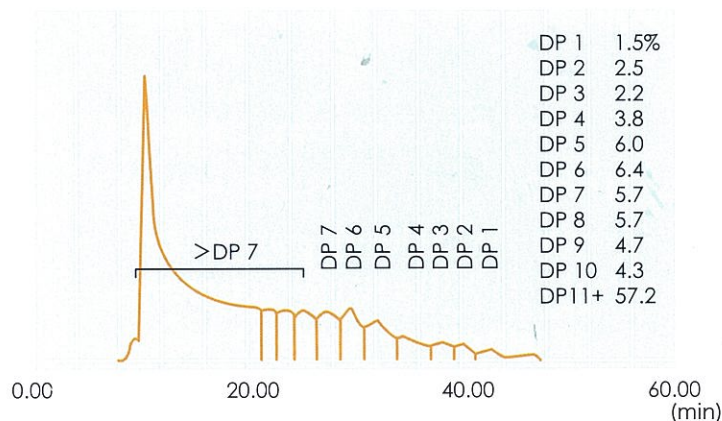
## Unique characteristics

- High fiber content:  $\geq 85\%$  (as-is)
- High solubility/ Low viscosity/ Transparent solution
- Does not add taste or texture to the food product
- High stability to acid, heat and retort
- Improves flavor and after taste of high-intensity sweeteners
- Slow fermentation: less gas problem (less flatulence)
- A lot of scientific studies to support physiological functions



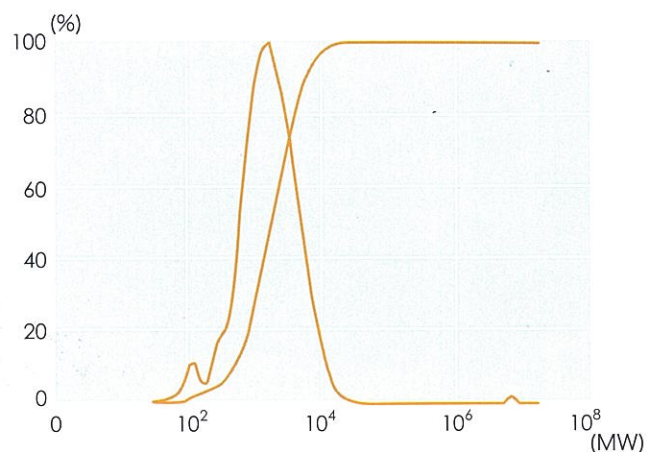
### Sugar Composition (DE: ~10)

Column: MCI GEL CK-04SS  
 Column Temp: 80°C  
 Carrier: Water  
 Detector: RI



### Molecular Weight Distribution (Average MW: ~2,000)

Column: Shodex Ionpak S-802/4/5/6  
 Column Temp: 60°C  
 Carrier: Water  
 Detector: RI



# Scientifically Proven Physiological Functions

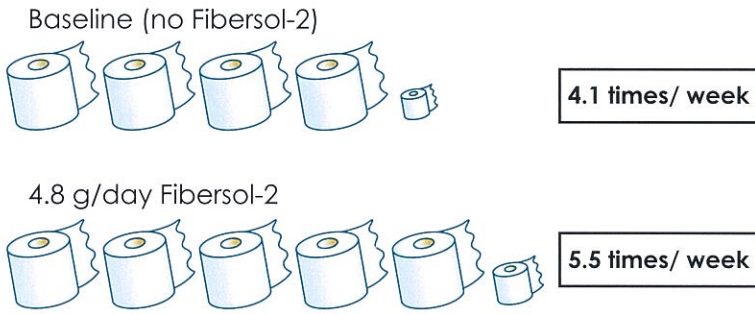
## 1. Intestinal Regularity

Fibersol-2 reaches the large intestine and helps maintain healthy bowel movement.

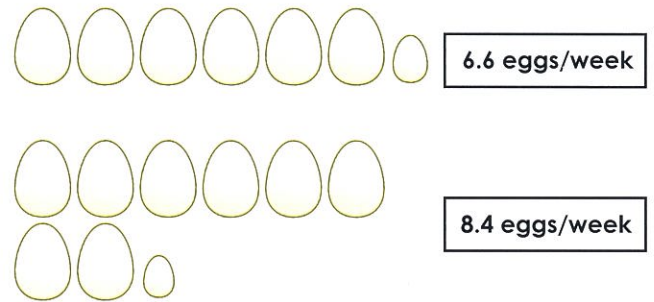
### Stool Frequencies and Fecal Volume Study

(Dosage: 4.8 g/ day for 14 days. Subject: 20 constipated adult females. Single-blind, cross-over study)

#### Stool Frequencies



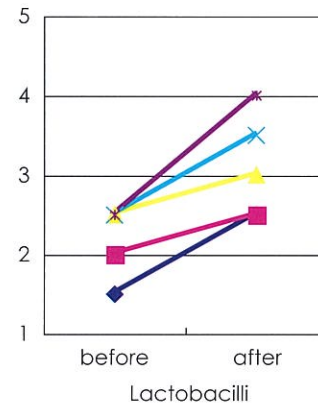
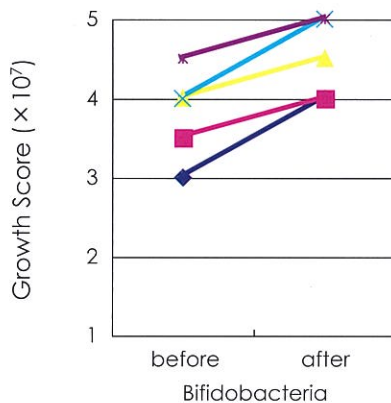
#### Fecal Volume



► Result Fibersol-2 increases stool frequencies and fecal volume.

*J. Nutritional Food, 2001, 4 (4): 21-27*

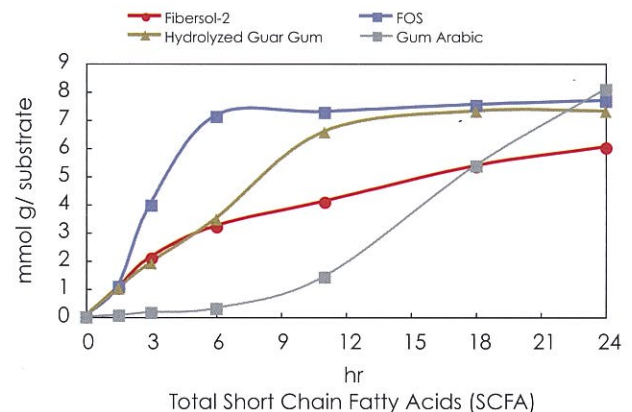
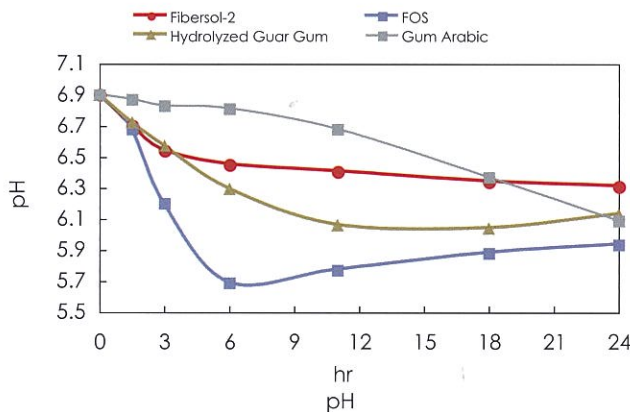
### Fecal Bacteria Study (Dosage: 30 g/ day for 8 days. n=5. Cross-over study)



► Result: Fibersol-2 increases beneficial bacteria.

*Laurentin and Edwards, 2004*

### Slow Fermentation---Less Flatulence Problem (In-vitro study using human fecal dilution)



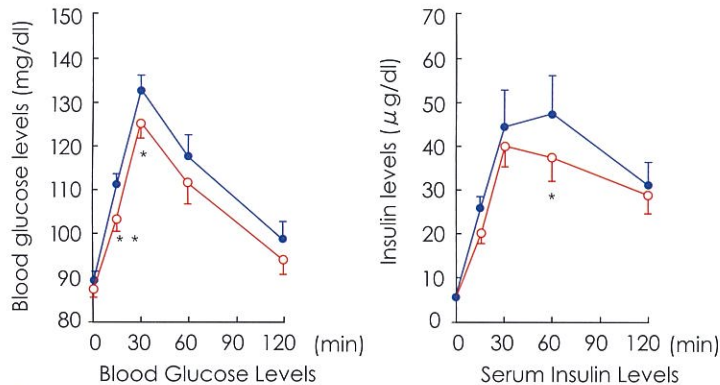
► Result: Fibersol-2 is gradually fermented, which causes less gas production in the intestines.

*Journal of Nutrition, 2000; 130: 1267-1273*

## 2. Suppression of Postprandial Rises in Blood Glucose/ Insulin/ Triglyceride

### Blood Glucose/ Insulin

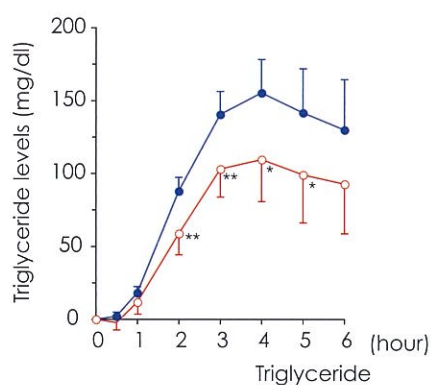
(Dosage: 5.7g, Subject: 20 healthy adult. Single-blind, cross-over study)



○: Fibersol-2 + 300 g Steamed Rice; ●: Placebo + 300 g Steamed Rice

### Serum Triglyceride

(Dosage: 5.0g, Subject: 13 healthy adult. Single-blind, cross-over study)



○: Fibersol-2 + High Fat Meal; ●: Placebo + High Fat Meal

▶ **Result: Fibersol-2 attenuates postprandial blood glucose/ insulin levels.**

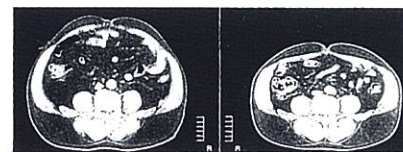
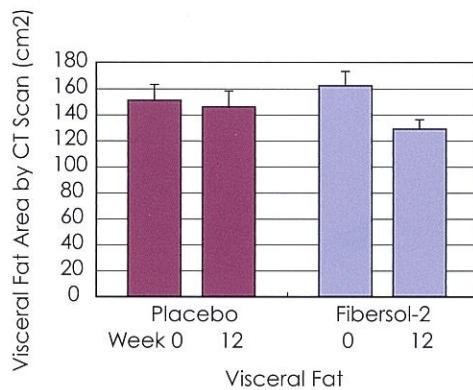
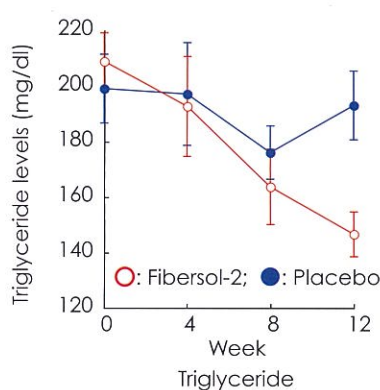
*J. Nutritional Food, 2002, 5(2), 31-39*

▶ **Result: Fibersol-2 attenuates postprandial serum triglyceride levels.**

*Eur J Nutr, 2007, 46, 133-138*

## 3. Chronic Triglyceride and Visceral Fat

(Dosage: 10g × 3 times, Subject: 38 healthy adult. Double-blind, parallel study)



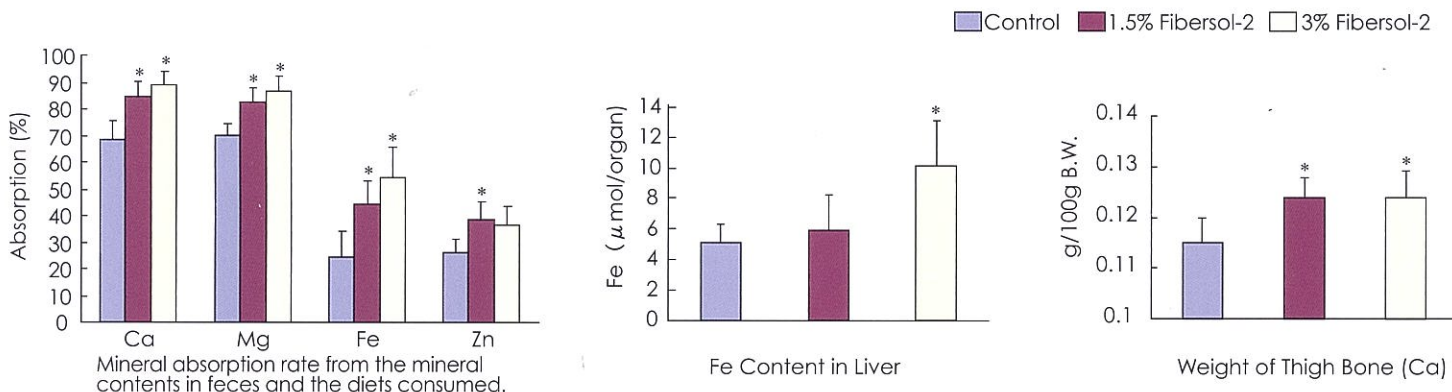
Example of a remarkable improvement in visceral fat (64 yrs old male)

▶ **Result: Continual Ingestion of Fibersol-2 attenuates serum triglyceride/ visceral levels.**

*J. Jpn. Soc. Study of Obesity, 2007, 13, 34-41*

## 4. Mineral Absorptions (Rat)

(Dosage: 0, 1.5, 3% Fibersol-2-added feed for 7 days, N=8/ each group)

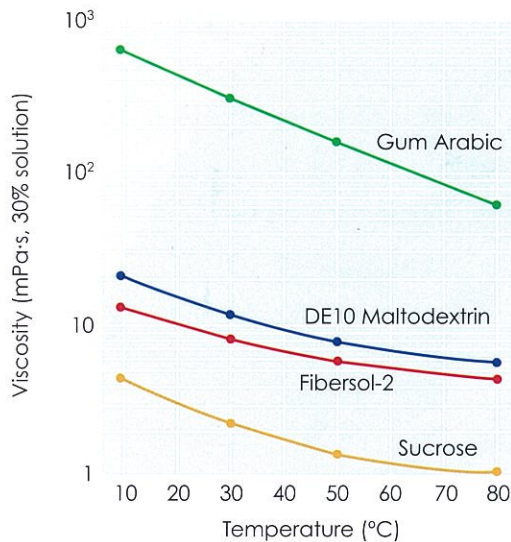


▶ **Result: Continual Ingestion of Fibersol-2 helps promote mineral absorption.**

*(Unpublished data, 2007)*

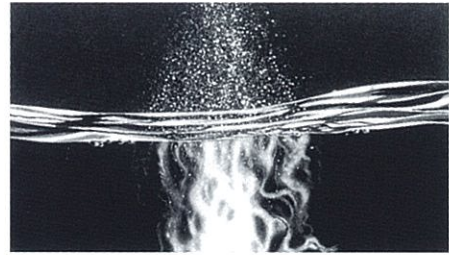
# Physicochemical Characteristics

## 1. Low Viscosity



## 2. Solubility/ Dispersibility

Fibersol-2 has excellent solubility and dispersibility for effective production.



## 3. Transparency

Fibersol-2 has excellent transparency.

## 4. Clean Taste

Fibersol-2 has clean taste/ flavor with 1/10 sweetness of sucrose.

## Typical Analysis

- Soluble Dietary Fiber:  $\geq 85\%$   
(AOAC Official Method 2001.03)
- Appearance: White powder
- Solution: clear, transparent
- Moisture:  $\leq 5\%$
- DE:  $\sim 10$
- pH (10% solution): 4.0-6.0
- Ash:  $\leq 5\%$
- Calories:  
varies according to the local regulations.

## Labeling Information

- Europe: Dextrin/ Resistant Dextrin
- US: Digestion Resistant Maltodextrin  
/Maltodextrin (Fiber)/ Maltodextrin, etc.
- Japan: Indigestible Dextrin

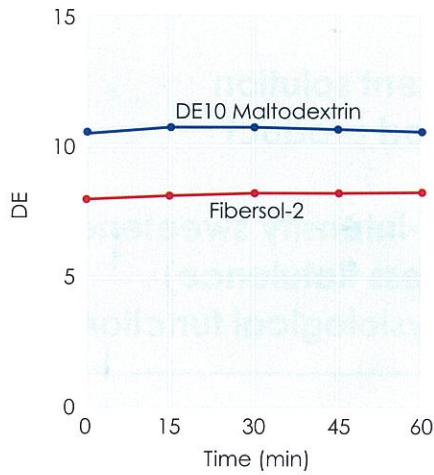
## Applications

- Beverages
- Dry Mixes
- Nutritional/Functional Foods
- Cultured Dairy Products
- Frozen Dairy Desserts
- General Processed Foods
- Cereals
- Confectionery Products
- High-Intensity Sweeteners
- Snack Foods
- Baked Goods
- Processed Meats

# Stability

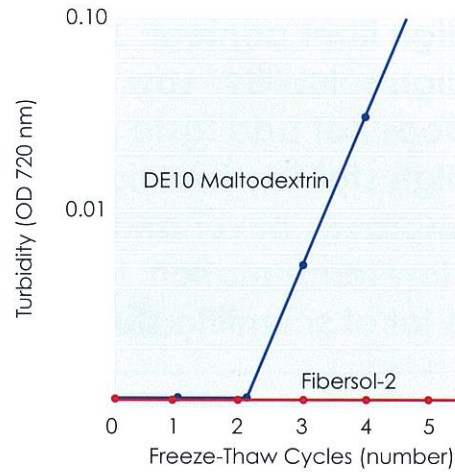
## 1. Acid Stability

10% Fibersol-2 solution (pH 2.4) was maintained at 100°C.



**Fibersol-2 is stable to acid.**

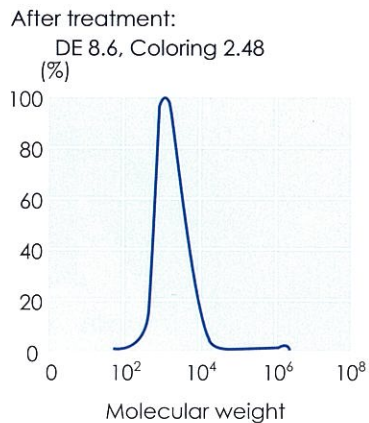
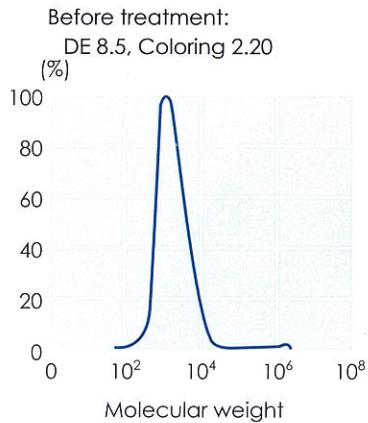
## 2. Freeze-thaw Stability



**Fibersol-2 is stable to freeze/ thaw.**

## 3. Retort Stability

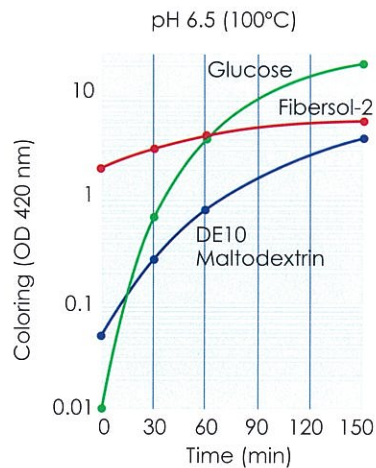
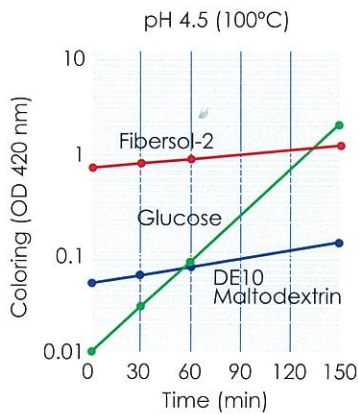
10% Fibersol-2 solution was autoclaved at 120°C, 2 kg/f/cm<sup>2</sup> for 10 min.



**Fibersol-2 is stable to retort treatment.**

## 4. Browning Stability

10% Fibersol-2 solution with 1% glycine (pH 4.5 or 6.5) was maintained at 100°C.



**Fibersol-2 has little browning property.**



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