

# Industry Updates

Trends, Formulations and Developments in the Food and Nutraceuticals Industry

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## Formulations

### Beverage Emulsion Concentrate

Ingredients	%
Ticamulsion A-2010	4-6
Orange oil/Weighting agent*	10-15
Color Yellow #5/6	0.30
Sodium benzoate	0.10
Citric acid, 50 % soln	q.s
Flavor	q.s
Water	q.s.
	100.0%

\*Note: Adjust the specific gravity of the oil to that of the aqueous solution by adding weighting agents like SAIB, BVO or ester gum.

### Recommended procedure:

1. Add the sodium benzoate/preservative to the water (75% of water in formula).
2. Hydrate the gum in water and mix thoroughly in a tank for 2 hours. If using a Pre-Hydrated® Gum, mixing time may be as little as one hour.
3. Add the weighting agent and any solvents to the citrus oil and mix until fully dissolved and uniform.
4. Disperse the color in 50 times its weight of water.
5. Add the dissolved color to the gum solution in the tank and mix well.
6. Add citric acid to adjust the pH, as required.
7. Add the weighted oil and the flavor to the aqueous solution. Mix the oil and water solutions for approximately 15 minutes and until uniform.
8. Homogenize at 3500/500 psi twice.

## Low-Fiber Diets are a Prescription for Prebiotics: Gums are Prebiotics

Dennis T. Gordon, Ph.D.

My first article, *The Atkins Diet Makes for a Low Carbohydrate Diet*, Fall 2003, focused on the Atkins Diet and similar low carbohydrate diets, which are causing a major change in dietary habits. The Atkins Diet is rapidly winning converts for weight management.

Excessive weight gain is a serious public health epidemic; however, strict adherence to the low carbohydrate, high protein diets for more than a few months can cause some serious health complications. The Atkins Diet curtails the consumption of a variety of foods that provide thousands of health promoting compounds (nutraceuticals) that help prevent many diseases. Also, these diets can provide too much protein, which taxes the kidneys, and too much fat, which leads to higher blood lipid levels and cardiovascular disease. Finally, the Atkins Diet significantly reduces the recommended amount of dietary fiber participants consume.

The U.S. National Academy of Sciences (NAS) recently established the first set of guidelines for dietary fiber intake which suggests that women and men should eat a wide variety of foods to provide 25g and 38g of fiber, respectively per day. At the time of these first guidelines, average consumption was approximately one-half these recommended amounts. Adherence to a low carbohydrate diet which significantly reduces the variety of foods consumed could lower dietary fiber intake to less than 25% of recommended amounts, and this can lead to serious health complications such as constipation, diverticulosis, and intestinal cancers.

Dietary fiber is simply the carbohydrate portion of the diet that is nondigestible and is commonly described as consisting of insoluble and soluble fractions. As insoluble dietary fiber passes through the intestine, it provides bulk and holds water that aids regular bowel movements, thus preventing constipation. Examples

of insoluble dietary fiber are cellulose, hemicellulose, and wheat bran. When insoluble dietary fiber reaches the large intestine, it undergoes partial fermentation. However, soluble dietary fiber such as guar gum, gum arabic, pectin, and alginates undergo almost complete fermentation. Due to the extent of the fermentation, gums contribute 0 net carbohydrates to the diet because the carbohydrate portion is soluble dietary fiber. Once fermented, soluble fiber becomes "the" important source of energy for intestinal bacterial growth. The relatively new term (1995) used to describe soluble dietary fiber or gums is "prebiotic."

A more scientific definition of a prebiotic is "a nondigestible food ingredient that beneficially affects the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon, and thus improves host health".<sup>1</sup> As prebiotics are fermented in the large intestine, more short chain fatty acids (SCFA) (i.e., acetic, propionic, and butyric) are produced. The SCFA decrease the pH of the large intestine favoring the growth of more non-pathogenic organisms (*Lactobacillus* and *Bifidobacteria sp*) compared to pathogenic organisms (i.e., *Proteus* and *Staphylococci sp*). These changes in the large intestine, brought about by increased fermentation of prebiotics, leads to increased disease prevention.

It's important for food developers to recognize that current diets limit food choices and are too low in dietary fiber, and prebiotics explore other avenues for including fiber in the diet. Creatively designed foods that provide complete nutrition are one way to help ease the obesity epidemic.

<sup>1</sup> Gibson G., R and Roberfroid M. B. Dietary modulation of the human colonic microbiota—introducing the concept of prebiotic. 1995. *J. Nutr.*, 125:1401-1412.

