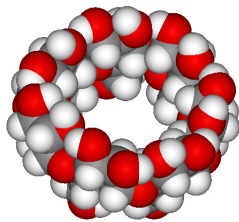


## MEDICAL DISCLAIMER

This content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. The document is for informational purposes only.

## WiO Smart Fat Blocker

The WiO Smart Fat Blocker™ is a natural non-reducing chiral polysaccharide fiber (WiO FB), whose molecules are made of several glucose building blocks units that are covalently attached end to end via  $\alpha$ -1, 4 linkages which forms a truncated cone configuration.



These formations of molecules are an “All Natural” extraction process degradation of starch, primarily corn. The WiO FB molecules are structured so that the hydrophilic (water-loving) glucose building blocks face outwards and there is a lipophilic cavity (i.e.: one with an affinity for fat) on the inside. This cavity can receive another lipophilic molecule as “guest,” the cohesion between the two molecules is only produced by relatively weak van der Waals forces (weak, short-range electrostatic attractive forces between uncharged molecules, arising from the interaction of permanent or transient electric dipole moments), The weak van der Waals forces in such inclusion compounds leave the two counterpart molecules unchanged.

Most all consumers are aware that when counting calories and grams of carbohydrates that consumers subtract the grams of fiber from the total carbohydrates because they don’t count, digestively speaking. The concept of subtracting fiber from total carbohydrates is a principle called “digestibility-correction.” This is the very reason consumers and the general public have been taught to subtract the fiber from total carbohydrates is because we (humans) can’t digest fiber carbohydrates. Even though fiber has calories, humans can’t use it for energy because we don’t have the right kind of digestive enzymes to break them down and absorb them. Reviewing the nutrition facts label provides an example as to why the total calories are 50:

Amount per serving		
<b>Calories</b>	<b>50</b>	<b>Calories from Fat 10</b>
% Daily Value*		
Total Fat	1g1	%
Saturated Fat	0g0	%
Cholesterol	0mg	0%
Sodium	115mg5	%
Total Carbohydrate	10g	3%
Dietary Fiber	5g	20%
Sugars	1g	

### Follow this math example of Digestibility Corrected:

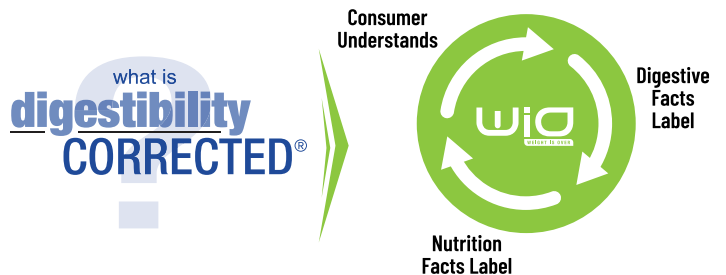
- 1 gram of fat is 9 calories

- 10 grams of carbohydrates is 40 calories
- Add the 1 gram of fat (9 calories) and 10 grams of carbs (40 calories) together and they total 50 calories (rounded up)
- Take note, that half of the total carbohydrates (5 grams) is fiber

Since humans can’t digest the energy calories from fiber (20 calories sample above) poses the question “why doesn’t the label say 30 calories instead of 50?” Because the purpose of the Nutrition Facts pannel to inform the consumer of what is “in” the food. And it is the responsibility of the food manufacturer to inform the consumer IF the macro-nutrients will be digested differently than what is posted on the Nutrition Facts label. A bomb calorimeter machine is used to determine the caloric value of those ingredients. A bomb calorimeter burns the food sample with an argon flame to determine the caloric total. As we all know, the human body doesn’t burn calories with “fire” to get energy, instead the body’s uses enzyme digestion to break down food to absorb the nutrients.

## What is Digestibility Corrected?

The concept of ‘digestibility-correction’ (DC) isn’t new, it was adopted by the FDA back in 1993 and listed in the CFR (Code of Federal Regulations). It is a principle recognized and approved by both the FDA and USDA. The CFR even gives an example of the term “digestibility-corrected” (DC). The CFR example shows that certain proteins are not absorbed by all persons at the same rate or value. Baby formulas was given as an example by the FDA in the CFR. Mostly DC has been used to identify the digestive quality of different proteins, but can be applied to all nutrients, as applicable.



A common question is, “Why do WiO products have two (2) nutritional pannels, I haven’t seen that before?” The CFR requires food manufacturers to both inform the consumer WHAT is in the food, and HOW much of the macronutrients (Fat, Protein, Carbs) are being digested, if they have knowledge that those nutrients are absorbed at different levels than is posted in the Nutrition Facts pannel.

## BORN IN THE DOCTOR’S OFFICE

WiO started their research in 2008 with a powdered meal-replacement program that was provided to doctors to help manage the symptoms

of metabolic syndrome, i.e. those that are overweight, have high blood pressure, high cholesterol or elevated glucose levels. WiO does not promised a cure, but we believe and have discovered thousands of clinical studies that found that a healthy diet consisting of whole-food vitamin and minerals, lower carbohydrates and incorporating more omega fats in the diet may offer some desired health benefits. WiO understands that most people find it very challenging to cut out all carbohydrates and can't control all the unhealthy fats that are in the foods they love. They researched on how to implement all-natural inhibitors and blockers into foods, giving consumers the option to enjoy the foods they have always loved but with an added tool to help manage vitamins, minerals, carbohydrate and unhealthy fat intake.

The science of inhibiting and blocking was developed decades ago. The natural process has been in place ever since the growth of flora and since living things started digesting foods, thanks to Mother Nature.

## Inhibiting Carbohydrates

### DRUGS

Alpha-glucosidase inhibitors are oral anti-diabetic drugs used most often for diabetes mellitus type 2 that work by preventing the digestion of carbohydrates (such as starch and table sugar). Carbohydrates are normally converted into simple sugars (monosaccharides), which can be absorbed through the intestine. Hence, alpha-glucosidase inhibitors reduce the impact of carbohydrates on blood sugar. Doctors have been using these drugs for reducing the digestion of carbohydrates for years. Types of Alpha-Glucosidase Inhibitors.

Commonly prescribed types of alpha-glucosidase inhibitors are:

- Acarbose (Precose)
- Miglitol (Glyset)
- Voglibose

### NATURAL ALPHA GLUCOSIDASE INHIBITORS

There are a large number of plants with Alpha-glucosidase inhibitor action.<sup>[1][2]</sup> For example, research has shown the culinary mushroom Maitake (*Grifola frondosa*) has a hypoglycemic effect. The reason Maitake lowers blood sugar is because the mushroom naturally contains an alpha glucosidase inhibitor. Another plant attracting a lot of attention is *Salacia oblonga*, and White kidney bean.

### MECHANISM OF ACTION

Alpha-glucosidase inhibitors are saccharides that act as competitive inhibitors of enzymes needed to digest carbohydrates: specifically alpha-glucosidase enzymes in the brush border of the small intestines. The membrane-bound intestinal alpha-glucosidases hydrolyze oligo-

saccharides, tri-saccharides, and disaccharides to glucose and other monosaccharides in the small intestine. Acarbose also blocks pancreatic alpha-amylase in addition to inhibiting membrane-bound alpha-glucosidases. Pancreatic alpha-amylase hydrolyzes complex starches to oligosaccharides in the lumen of the small intestine. Inhibition of these enzyme systems reduces the rate of digestion of carbohydrates. Less glucose is absorbed because the carbohydrates are not broken down into glucose molecules. In diabetic patients, the short-term effect of these drugs therapies is to decrease current blood glucose levels and the long-term effect is a small reduction in hemoglobin A1c level.<sup>[10]</sup>

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  2. Ji, Fang; Xiao, Gouchun; Dong, Li; Ma, Zijiao; Ni, Jingman (2010). Development of  $\alpha$ -glucosidase inhibitor from medicinal herbs. *China Journal of Chinese Materia Medica (in Chinese)* 35 (12): 1633-40. doi:10.4268/cjcm20101229. PMID 20815224.
  10. Venable, Samantha J.; Aschenbrenner, Diane S. *Drug Therapy In Nursing*. Hagerstown, MD: Lippincott Williams & Wilkins. ISBN 0-7817-4839-9.

## Blocking Fats

### A BIG FAT LIE?

Just as there are drugs that inhibit carbohydrates there are also drugs that will block fats. WiO believes that excess fats alone are not the primary cause of health issues, but rather the combination of too many carbohydrates and fats together and a deficiency in vitamins, minerals, prebiotics, probiotics, and digestive enzymes. They also support the idea that a person would be better served if they were to block or eliminate as many of the unhealthy fats and synthetic vitamins and mineral in their diet and replace them with healthier omega fats, i.e.: omega 3, n-6, n-7, n-9, and micro-nutrients from whole food sources.

The most commonly prescribed types of drugs that block fats are:

- Orlistat (also known as tetrahydrolipstatin) is a drug designed to treat obesity. It is marketed as a prescription drug under the trade name Xenical by Roche in most countries, and is sold over-the-counter as Alli by GlaxoSmithKline in the United Kingdom and the United States. Its primary function is preventing the absorption of fats from the human diet by acting as a lipase inhibitor, thereby reducing caloric intake. It is intended for use in conjunction with a healthcare provider-supervised reduced-calorie diet.
- Ezetimibe is a drug that lowers plasma cholesterol levels. It acts by decreasing cholesterol absorption in the small intestine. It may be used alone (marketed as Zetia or Ezetrol), when other cholesterol-lowering medications are not tolerated.
- Cetilistat is a drug designed to treat obesity. It acts in the same way as the older drug Orlistat (Xenical) by inhibiting pancreatic lipase, an enzyme that breaks down triglycerides in the intestine. Without this enzyme, triglycerides from the diet are prevented from being hydrolyzed into absorbable free fatty acids and are excreted undigested.

## NATURE FIRST

Most drugs are synthetic copies of a natural version. Usually the drug is stronger, but the natural counterpart doesn't offend with the negative side-effects associated to the man-made creation.

WiO believes that feeding your cells real foods is nutritionally superior to taking pills. WiO created a meal-replacement shake that contains the nutritional equivalent of eating 32 pounds of whole foods. To help you in the fight of ensuring that your body receives the healthy ratio and quality of fats—because not ALL fats are created equal—WiO uses an all-natural blocker and incorporated it in their SmartFoods™ line. WiO Fat Blockers (WiO FB) are donut shaped circles of molecules that bring together fats and water and have a particular adhesion effect with each other. The creation of the WiO Fat Blocker extraction enables foods to have the structure, mouth feel and taste that consumers expect. The fat molecules are bonded so tightly in the cone that it eliminates digestive enzymes from breaking down these fats for absorption. Simply stated, that means that foods that have the WiO Fat Blocker in it will eventually render the food “fat free.” There is fat present in the food, however because it cannot be digested no calories from the fat can be metabolized or absorbed.

There are several clinical studies that confirm its effectiveness:

### 1: Preclinical data on weight and blood parameters

WiO FB was administered at a ratio of 10% of dietary fat to 42 animals. They were divided equally into low and high fat diet groups, and then subdivided into control groups and active. Animals were followed for 6 weeks.

Results: Animals exposed to WiO FB in the active group weighed less and had lower body fat percentage. WiO FB was also shown to significantly reduce triglycerides and leptin levels, while increasing insulin sensitivity. There was a significant increase of fat in fecal excretion.

October 19, 2007; Accepted: February 21, 2008;

Elke Maria Wagner (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

Alan Thomas Remaley (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

### 2: Preclinical data on plasma fatty acids

Randomized animals were placed on either a Western diet or a test diet. Diets were identical, except the cellulose fiber in the Western diet was replaced with WiO FB. Animals were given food and water and libitum. Blood samples were collected at 2, 5, 10 and 14 weeks.

Results: At the study's conclusion, there was a significant reduction in total cholesterol, proatherogenic lipoproteins and lower saturated fat blood levels. Data suggests that WiO FB may be useful in promoting cardiovascular health.

October 19, 2007; Accepted: February 21, 2008;

Elke Maria Wagner (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

Alan Thomas Remaley (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

### 3: Effect in obese patients with type II diabetes

A human 3-month, double-blind, placebo-controlled study that were obese and Type II diabetic patients. They took two grams of WiO FB per meal and were instructed not to change their eating or exercise habits.

Results: decreased triglycerides, total and LDL cholesterol levels in patients with high blood fat levels.

October 19, 2007; Accepted: February 21, 2008;

Elke Maria Wagner (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

Alan Thomas Remaley (Lipid Metabolism Section, NHLBI, NIH, Bethesda, MD 20892, USA)

### 4: Effect on lipid levels in healthy overweight

A human double-blind, placebo controlled two-month crossover study with overweight (but not obese) volunteers. Patients took two tablets per meal, half taking a placebo, half taking WiO FB. They were instructed not to change eating or activity programs.

Results: Statistically significant reduction of weight, total cholesterol, and LDL-Cholesterol levels. Near significance was found in increased insulin sensitivity and Apo B (p =0.06).

6 SEP 2012; DOI: 10.1038/oby.2010.280

Kevin B. Comerford; University of California, Davis, Department of Internal Medicine, United States, Human Biology.

Sidika E. Karakas, Endocrinology, Clinical Nutrition and Vascular Medicine, UC Davis Medical Center

### 5: Effect on Postprandial triglycerides

A double-blind, placebo-controlled trial investigated the acute postprandial responses in healthy adults over a 3-hour period to a fat-containing commercial breakfast with or without WiO FB. 34 healthy adults consumed a commercial breakfast (26 g of fat of which 10 g saturated fat) with 2 active or 2 placebo tablets.

WiO FB reduced significantly post-prandial blood triglyceride levels, demonstrating reduced energy absorption.

Results: This result has implications for improving health by reducing the postprandial pro-inflammatory and pro-oxidant states associated with the consumption of high fat diets.

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Evan Fletcher, Department of Nutrition and Food Science, Wayne State University, Detroit, MI 48202, USA

Eman Elserafy, Department of Nutrition and Food Science, Wayne State University, Detroit, MI 48202, USA

WiO believes that the use of vitamins and minerals from whole foods or synthetic alone with not benefit the consumer with a very effective method of weight loss. However, they do support the notion of combining it with other botanicals, herbs and all material extracts can provide an effective and healthy weight management program. WiO makes a declaration that the statements, products and protocol have not been evaluated by the FDA. The products are not intended to diagnose, treat, cure, or prevent any disease. Their products are intended as dietary supplements. Any information is intended as statistical and educational information only.

## Protein Digestion/Quality

The intent of this section is to outline the definitive definition of the digestion of food, not just proteins. Digestion is: The quality and quantity of macro and micro-nutrients that is delivered to human cells. Needless to say, not all proteins are created equal, and the quality of an individual's digestion will vary from person to person. The bottom line: the best proteins are those that have the greatest biological uptake.

Studies have shown that it is not uncommon for a poor digestion to reduce the digestion of any/all macro and micro-nutrient by 47%.<sup>[49]</sup> Some researchers have concluded that the digestive prowess of the average American has been decreased by 9-20%.<sup>[49]</sup> As you know, the breakdown of protein (and all macronutrients) begins in the mouth through the act of chewing. Seems too simple, but it is generally accepted that most people do not properly chew their food, therefore placing more work on the other five steps of digestion listed below:

### THE STEPS OF DIGESTION:

1. The mouth- Digestion begins when food enters the mouth. Chewing begins breaking down the food. Saliva begins breaking down the carbohydrates.

*Interesting Tip: Try chewing a saltine cracker for a full minute or two. You will begin to taste sweetness. That is an indication that the saliva is breaking down the carbohydrates into simple sugars.*

2. The esophagus- After the food is swallowed it enters the esophagus. The esophagus is a muscular tube that helps move the food along to the stomach.

3. The Stomach- In the stomach the enzyme pepsin is excreted and mixes with the hydrochloric acid (HCL) present in the stomach to begin the digestion of proteins. Once food is passed through the stomach is referred to as chyme.

*Interesting Tip: Often it is mistaken, that too much stomach acid causes acid reflux and heart burn. Too much stomach acid is a very rare condition, too little acid affect 15% of the population. By age 40, 40% of the population is affected, and by age 60, 50%.*

4. The intestines (small & large)- In the duodenum, the food is exposed to enzymes produced by the pancreas which will aid in breaking down proteins, carbohydrates and fats. In the small intestines the nutrients are absorbed through the microscopic finger like villi on the lining of the small intestines. Vitamins and minerals pair up with fats, proteins and carbohydrates to be absorbed.

*Interesting Tip: If vitamins and minerals are not present in the chyme (food), then they have to be extracted from the body. This can cause vitamin and mineral deficiencies which occur in 90% of women and 71% in men.<sup>[65]</sup>*

5. The Liver and the gallbladder- The presence of fat in a meal induces the gallbladder to release bile into the duodenum, which will aid in

the emulsification of fats. Bile, produced by the liver, are transported through specific ducts and stored in the gallbladder. The liver excretes bile into the small intestines to emulsify the fats in the chyme, making it easier for the body to absorb. The leftover bile is recycled into the gallbladder where it will be filtered by the liver and reused. 70% of all nutrient absorption takes place in the small intestine starting in the duodenum and progressing through the jejunum to the ileum.

*Interesting Tip: The liver provides several functions in the body besides filtering toxins. To reduce stress on the liver, avoid non EFA foods (high fat), alcohol, and toxic chemicals. Many experts support that 1 tablespoon of properly balanced EFA (n-3, n-6, n-9 2:1, 1:1) per 50 lbs. of body weight daily will prevent a host of many illnesses including gallstones.<sup>[64]</sup>*

6. The Large intestines- Whatever is not absorbed in the small intestines moves on to the large intestines to be eliminated. This is largely fiber and hard starches. Good bacteria are also present in the large intestines; they feed on soluble fiber and produce vitamin K for the body.

The primary reason for these deficiencies is the foods that we eat and medications that are taken. The following are examples of some of the classes of pharmaceutical medications have various effects upon the nutritional status of the user. Over time, these effects can become very significant as to the comfort level and even the survival of the person taking them.

### MEDICATIONS THAT REDUCE DIGESTIVE QUALITY

**Loop diuretics (furosemide)** - Excretion of sodium, chloride, potassium, hydrogen ions, calcium, magnesium, ammonium bicarbonate, and possibly phosphate is enhanced. After 4 weeks of furosemide use, thiamin concentrations and transketolase activity were significantly reduced.

**Thiazide diuretics (hydrochlorothiazide)** - Excretion of sodium, chloride, potassium, bicarbonate, magnesium, phosphate, and iodine are enhanced. Calcium excretion is decreased.

**Triamterene-containing diuretics (Dyazide, Dyrenium, Maxzide)** - Triamterene is potassium-sparing; supplementation could result in potassium overload. Folic acid deficiency is possible.

**Histamine H2 antagonists (Tagamet, Zantac, Pepcid, Axid)** - Reduction of gastric acid secretion, resulting in poor digestion of protein. Decreased vitamin B12. Gastric acid is required for B12 absorption. Tagamet inhibits cytochrome P-450 pathways.

**Biquanides (Metforman)** - Interferes with glucose absorption. Decreases absorption of B12.

**Potassium Chloride** - Interferes with the absorption of B12.

**Sulfasalazine** - Interferes with folic acid metabolism.

**Oral contraceptives** - Oral contraceptives have significantly increased plasma Vitamin A levels. This is thought to be mediated by steroid-induced alterations in the rate of retinal-binding protein synthesis and release; depletion of reserves may result. Vitamin B6 deficiencies due to alteration in B6 and tryptophan metabolism. Interference with folate absorption. Reduced serum B12 levels. Increased serum copper as a result of increased plasma ceruloplasmin; clinical importance has not been determined. Increased serum iron and increased total iron-binding capacity, along with increased incidence of iron deficiency anemia. Increased serum magnesium and zinc; clinical importance has not been determined.

**Corticosteroids (hydrocortisone, prednisone, dexamethasone, etc.)** - Corticosteroids increase the rate of Vitamin A transport from the liver, resulting in elevated serum levels and depletion of reserves. Negative nitrogen balance due to increased protein catabolism. Increased calcium excretion (increased catabolism). Sodium retention (mineralocorticoid activity). Increased potassium excretion (sodium is exchanged for potassium). May deplete Vitamins B6, B12, and folic acid. May deplete Vitamin D3.

**Bile acid sequestrants (Questran)** - Interference with absorption of fats and fat-soluble vitamins. Enhanced absorption of chloride ions in exchange for bicarbonate ions, which may lead to acidosis. Increased urinary calcium excretion. Increased urinary magnesium excretion. Altered absorption of phosphate and nitrogen. Vitamin K deficiency. Reduced folic acid absorption. Reduced absorption of Vitamin E and iron are possible.

**HMG-CoA reductase inhibitors (Zocor, Mevacor, Pravachol)** - Block the biosynthesis of Coenzyme Q-10.

**Levodopa** - Pyridoxine reverses the effects of levodopa, although this does not occur when levodopa is given with carbidopa. (Pyridoxine stimulates decarboxylation of levodopa in the periphery; carbidopa inhibits decarboxylation.)

**Phenytoin (Dilantin)** - Folate deficiency - Increased folate catabolism or utilization as a result of enzyme induction is considered to be the mechanism. However, supplementation may decrease the effectiveness of the phenytoin. Interference with Vitamin D metabolism.

**Folic acid analogs (methotrexate, pyrimethamine, trimethoprim)** - These antagonists inhibit the enzyme dihydrofolate reductase, which can lead to a functional folate deficiency. Supplementation can antagonize the effects of these drugs.

**NSAIDs (Motrin, Naprosyn, Tylenol, ASA, etc.)** - Reduce night-time melatonin secretion (related to prostaglandin inhibition).

**Isoniazid** - Increases excretion of pyridoxine into the urine, resulting in deficiency. Inhibits the tryptophan-to-*niacin* pathway, resulting in increased need for *niacin* and tryptophan.<sup>[66]</sup>

Another focus must be made on the vital organs that play a pivotal role in digestion referred to as "incompetence."

## PANCREATIC INCOMPETENCE

The pancreas is, as the acid producing parietal cells of the stomach also are, especially sensitive to toxins. One of the toxins to which the pancreas is especially sensitive is alcohol. As discussed, many people are unable to fully digest their food, because the pancreas is not producing sufficient amylase, lipase and proteinase.

## LIVER INCOMPETENCE

When the liver is damaged, it ceases to put out a healthy complement of bile salts, and this causes a failure of emulsification of fats leading to poor digestion of fats.

## COLONIC INCOMPETENCE

The frequently overlooked colon is equally important to health as any of the other organs of digestion. With age, a low fiber diet and low intake of water, it may slow down and stasis (standing still) of food occurs, thereby allowing unfriendly bacteria to multiply, producing toxic material which leads to fatigue, headache, anxiety, insomnia, etc.

Companies make claims of how their protein formulation has achieved 100% digestibility. Especially sport nutrition companies will add supplements containing protein-based hormones such as Growth Hormone (GH), Insulin-Like Growth Factor 1 (IGF-1). The human digestion of protein just doesn't work this way, such peptide hormones will simply be digested in the gut and lose their biological availability. Major pharmaceutical companies have been trying to make oral insulin (protein-based hormone) for diabetic treatment and have given up on it because the human body doesn't digest in such a manner. If the big drug companies haven't figured out how to do it, neither has the protein powder company with much smaller budgets for R&D, regardless of the claims made in their ads. Besides, even the most efficient human digestive system will not operate at 100% digestibility.

It must be understood that to optimize the absorption of nutrients of protein (foods) the following areas must be considered:

The quality of the protein, (BV and PDCAAS)

**The addition of vitamins and minerals**

**The quality of the individuals' digestion.**

**The key areas of poor digestion can be identified as** inadequate digestive enzymes **affecting most Americans, too little stomach acid** (hydrochloric acid-HCL) is affecting 15% of the public,<sup>[57]</sup> too much acid is rare. Stomach aches or poor digestion is the number #1 health complaint to healthcare professionals in the United States. As many as 47% of the American public reports that they suffer from poor digestive issues on a day-to-day basis.<sup>[57]</sup>

## True Digestibility

Essentially the bottom line is; if the body can't digest it and deliver it to the cells it is of no use to the human body. For this very reason, WiO Protocol focuses so much effort on improving the quality of the individual's digestion. In fact, WiO Diet is not a weight lost company at all, the loss of weight is simply a reward achieved. The heart of the WiO Protocol is to attempt to restore health to the pancreas, liver, and the digestion. By doing so all the symptoms associated to metabolic syndrome are improved or eradicated.

WiO's meal-replacement formula utilizes both peptide collagen and whey protein formulas. Because of the proven high cellular absorption and high cysteine content, these proteins are very effective at inhibiting the onset of metabolic syndrome more than other proteins.<sup>(58)</sup>

In this section we are focusing on protein digestion, but this discussion can be applied to all macro and micro-nutrients. Before we explore protein quality we need to make clear that the MOST important determining factor of ANY protein is the digestion of it - meaning "what is the quality (how good is) the individuals (the person consuming the protein) digestion"? In other words, how much of the protein will the dieter be able to digest and deliver to their cells?

Food Source	Protein Digestibility (%)
Peptide Collagen	98
Milk and Cheese	97
Mixed US Diet	96
Peanut Butter	95
Meat and Fish	94
Whey	91
Whole Wheat	86
Oatmeal	86
Soybeans	78
Rice	76

Source: National Research Council. Recommended Dietary Allowances, 10th ed. National Academy Press, 1989.

When looking at the quality of protein it is customary to consider the percentage level of protein i.e.: peptide collagen is at 98% and whey will vary from 80-91% depending on concentrate or isolate formulations. **Biological Value (BV)** is one of the more common methods of measuring protein quality and tends to be the one that is seen the most. BV is simply a measure of how much of the protein actually entering the bloodstream is retained in the body (in a perfect world of a properly working digestive system), with a healthy digestive system as

discussed above. **Protein Digestibility Corrected Amino Acid Score (PDCAAS)** is the newest method of scoring protein quality and is the one most in common use today. It compares the amino acid profile to some reference protein; as well it takes into account digestion.

However, the most striking fact of the chart above is what the general public interrupts from the information on the chart. A healthy reminder: the digestibility's of any protein is determined more on the power of the individual's digestion than anything else. Looking at the chart above, two major things stand out. First, contrary to the occasional vegetarian claim, vegetable source proteins have a significantly lower digestibility than animal source proteins. This actually has relevance for an issue beyond the scope of this article. Because they provide less available protein from consumption, a larger amount of vegetable proteins has to be consumed to meet human (or athletic) requirements. The second is that commonly available animal-source food source proteins have extremely high digestibility's, 94-97%. This means that for every 100 grams of protein consumed, 94-97 grams are being digested and assimilated by the gut.

## Vitamins & Minerals Digestibility

Much has been written on the value and need for vitamins and minerals. Any trained healthcare professional that understands micro-biology will not argue the necessity of these macro-nutrients. Without them we will suffer deficiencies and eventually die. Most of the debate about vitamins & minerals surrounds these topics:

- The need for supplementation
- Dosage requirements
- The form - the human body's preferred digestible formula.

Some patients will confess that their doctor has told them that they 'don't believe in vitamins'. After review we have found that what the doctor is likely saying "I don't believe that taking extra vitamins as supplements is necessary because you are getting what you need in the foods you eat." Doctors do believe in vitamins; they know that they exist and are required for good health. Some simply believe that people may be wasting their money in taking supplements because Mother Nature has put the vitamins in the food for you. We believe that this belief is based on what the doctors are not 'aware' of rather than what they 'know' to be true. According to the Max Planck Institute of Molecular Cell Biology and Genetics. *"Less than 6% of graduating physicians in the U.S.A receive any formal training in nutrition."<sup>(90)</sup>*

## Vitamins & Minerals in Our Food?

The facts are that over 90% of the foods (meats, fruits, vegetables and canned goods) that are available in the grocery stores are controlled by less than 10 multinational conglomerates. They dictate the quality of the foods we eat that includes what minerals are put into the soil.

Over 50% of the U.S.A. space is reserved for cultivating food and 30% of all crops grown are corn which is in 90% of all food products contributing to the metabolic syndrome epidemic. In the last 100 years the crop yield has increase from 20 bushels of corn per acre to over 200. One of the reasons for this increase in production is fertilization, which universally is nitrogen, phosphorous and potassium (NPK) in commercial farming. Our soil needs all 52 minerals in order to produce healthy foods, if it isn't in the soil it won't be in the food. According to WHO mortality data, around 1.6 million deaths (3% of the total) can be attributed to iron and vitamin A deficiency each year<sup>[91]</sup> and that is just one mineral and a vitamin. It's not that the farmers are evil, but rather all about being able to compete and profits! And it is not as profitable to make sure these foods are fortified with these macro-nutrients. A study of over 50,000 Americans was conducted by the USDA over twenty years ago found that not one (1) person was receiving 100% of the recommend vitamins & minerals from the foods that they ate!

The level of nutrients in our food is determined on 4 factors.

1. The level of vitamins and minerals in our food is based on the level of these macro-nutrients being present in the soil in which it is grown.
2. How long does it take for the food to travel from the farm (source) to your table?
3. Is the food being cooked?
4. What is the quality of the digestives system of the person eating the food?

Why are our foods 'fortified'? We have all read on the label of the foods we eat that it has been fortified. As yourself 'why'? Why are they putting some vitamins and minerals in the food? Are they just being nice and want us to have an extra boost to get us through the day? When foods are processed, they can lose the effectiveness of vitamins, minerals and enzymes, often 100% of enzymes are depleted.<sup>[90]</sup> Food manufactures will put some back in because they destroyed them while it was being processed. However, the form (quality) that they put in is not the same as what was destroyed. And 'why not' you ask, because it costs more. For example, there are as many as 9 different form of vitamin C (L-ascorbic acid). Not all forms are bio-available (digested) equally; some have a higher quality than others. Powered ascorbic acid is the least expensive and is generally what you will find as an additive in foods and supplements. It is worth noting that vitamins and minerals work hand and hand. Without combining their counterpart minerals with a vitamin and the effectiveness is greatly diminished.

## From the Cradle to Your Plate

*"Nearly every food that you find in shops in the city have been processed until the nutrients have been depleted or eliminated by the time it gets on the plate, we use and use the soil [without restoring] the*

*nutrients, they are the center of our soils, they are becoming a desert worldwide.*<sup>[92]</sup> It's not just that our foods don't have the nutrients that they used to but if they have any nutrients in them when they are pulled from the ground or plucked from the tree, bush, or vine they are lost by the time they hit our plate. It takes at least a week and travels 1,500-2,000 miles to get to your local store.<sup>[93]</sup> The food is treated and sprayed with ethane to turn color so they 'look' like they ripened on the vine... but didn't.

## If It Can't Take the Heat – Get It Out of the Kitchen

As if nutrient depleted soil, our food sitting in a warehouse or traveling thousands of miles wasn't enough; heat will destroy a good portion of the remaining nutrients. At least 50% of protein is destroyed when it is cooked.<sup>[90]</sup> All enzymes in the food can be eliminated even when seaming your vegetables.<sup>[94]</sup> Digestive Leukocytosis is the result of not eating enough raw vegetables and eating too high of a cooked vegetables ratio. Digestive Leukocytosis an increase in the number of white blood cells after eating foods heated to a certain temperature, whereas raw, unheated foods did not have this effect. Leukocytosis refers to an increase in the total number of white blood cells from any cause. It indicates that the body is under attack and these leukocytes (white blood cells) are sent to the site of the attack to help defend it, thus putting the immune system under needless stress. The study also found similar results with cured, salted, canned, cooked meats brought on a violent reaction, equivalent to the leukocytosis seen in poisoning. It is recommended to eat at least 10% by volume of raw vegetables if cooking is required or desired. According to Kouchakoff [1937, pp. 330-332], foods heated below their critical temperature for less than 30 minutes don't induce digestive leukocytosis. Critical temperatures vary between 87°C (189°F) and 97°C (207°F). The message here, is that since much our food is cooked, over cooked and reheated again, supplementing enzymes back into our diet is essential – which makes a case as to why WiO's MRP is fortified with enzymes including pre and probiotics.

## MEDICAL DISCLAIMER

**This content is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Always seek the advice of your physician or other qualified health provider with any questions you may have regarding a medical condition. The document is for informational purposes only.**