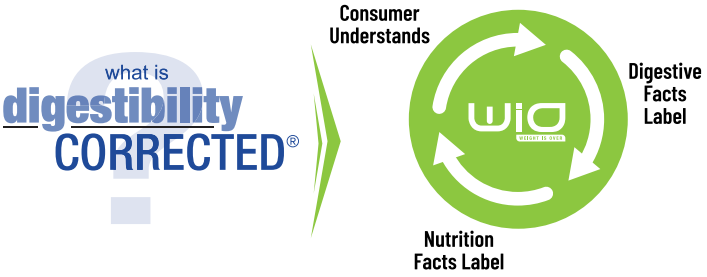
What is Digestibility Corrected?

WiO uses all-natural plant-based ingredients in their SmartFoods™ and MRP SmartShakes™ that function as carb-inhibitors and fat-blockers so that the body simply does not absorb the carbs and fats. Digestibility Corrected measures how much the body may digest of carbohydrates or fats. Labels with this symbol indicate that not all carbs and fats may be digested. The bottom line is: if the body can't digest it and deliver it to the cells (because of the carb inhibitors and fat blockers) it is of no use to the human body and is eliminated.

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.



According to the CFR food manufacturers are required to inform the consumer if the food item may not be digested at the same "nutritional" values as posted in the Nutrition Facts label. WiO products have BOTH the Nutrition Facts and a Digestive Facts section on each of their SmartFood™ labels.

BORN IN THE DOCTOR'S OFFICE

WiO started their research almost 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 foods. 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.

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.[1],[2] 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, as well as white kidney beans.

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 oligosaccharides, 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.[10]

1. ^ **Benalla, Wafaa; Bellahcen, Said; Bnouham, Mohamed** (2010). "Antidiabetic Medicinal Plants as a Source of Alpha Glucosidase Inhibitors". Current Diabetes Reviews 6 (4): 247–54. doi:10.2174/157339910791658826. PMID 20522017.
2. ^ **Ji, Fang; Xiao, Guochun; Dong, Li; Ma, Zijiao; Ni, Jingman** (2010). 药用植物来源的α-葡萄糖苷酶抑制剂研究进展 [Development of α-glucosidase inhibitor from medicinal herbs]. China Journal of Chinese Materia Medica (in Chinese) 35 (12): 1633–40. doi:10.4268/cjcmm20101229. PMID 20815224.
10. ^ **Venable, Samantha J.; Aschenbrenner, Diane S.** Drug Therapy In Nursing. Hagerstown, MD: Lippincott Williams & Wilkins. ISBN 0-7817-4839-9.

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What is Digestibility Corrected?

Protein Digestion/Quality

The intent of this section is to outline the comprehensive definition of the digestion of food, not just proteins. Digestion is: The quality and quantity of macro and micronutrients 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. Basically, 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 digestive system to reduce the digestion of any/all macro and micronutrients by 47%.[49] Some researchers have concluded that the digestive prowess of the average American has been decreased by 9-20%.[49] 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 it is referred to as chyme.

Interesting Tip: A common misconception is that too much stomach acid causes acid reflux and heart burn. Too much stomach acid is a very rare condition, too little acid affects 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. [65]

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 (Essential Fatty Acids) 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.[64]

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. 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.

True Digestibility

The bottom line: 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, the WiO Protocol focuses a lot of effort on improving the quality of an individual's digestion. In fact, WiO Diet is not a weight loss company at all, the loss of weight is simply a secondary reward or benefit. 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.

At WiO we utilize both canola and whey proteins; a special patented formulation of canola protein is uniquely enriched with cysteine and sulfur amino acids. Whey protein is recognized for its high cysteine

What is Digestibility Corrected?

content. Canola has nearly twice as much as whey. Canola could very well inhibit the onset of metabolic syndrome more than any other protein. [58]

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 it's digestibility – meaning how good is the individual's 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 (%)
Egg / Canola protein	98
Milk and Cheese	97
Mixed US Diet	96
Peanut Butter	95
Meat and Fish	94
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 ie: egg and canola are 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 proteins; and also takes into account digestion. However, the most striking fact of the chart above is what the general public interprets from the information on the chart. Remember that the digestibility 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, because they provide less available protein from consumption, and 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, 94-97%. This means that for every 100 grams of protein consumed, 94-97 grams are being digested and assimilated by the gut.

