

## Role of Whole Grain Cereals in Weight Management

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Cereal grains have been consumed by mankind since time immemorial. According to the American Association of Cereal Chemists International (AACCI) “whole grains shall consist of the intact, ground, cracked, or flaked caryopsis (kernel or seed), whose principal anatomical components-the starchy endosperm, germ, and bran-are present in the same relative proportion as they exist in the intact caryopsis” [2]. Whole grains and whole-grain-based products have the ability to enhance health besides acting as a source of energy and nutrients. Due to this reason, health experts and nutritionists across the world are advocating the inclusion of whole grains in the diets. Obesity has reached global epidemic proportions in both adults and children and is associated with cardiovascular and metabolic diseases such as type 2 diabetes. Seventy percent of all American adults are either overweight or obese [3]. To counter this problem, we need to select cereal grains, fruits, and vegetables which are high in dietary fiber and low in saturated fats. Examples of whole grain foods include wild rice, oatmeal, brown rice, barley, wheat berries and flours such as whole wheat.

Cereal grains that we consume are a good source of both macro and micronutrients. But most of the cereal grains that we consume arrive at our door step after milling process. The downside of milling process is that it eliminates the outer layers of the grain (bran and germ) rich in various vitamins, minerals, fibers, phytochemicals, and preserves only the starch-rich white endosperm [4]. The various health benefits of cereals are actually due to the presence of this outer layer and not just endosperm. Whole grains are a very good source of dietary fibers (such as inulin),  $\beta$ -glucan, starch, carotenoids ( $\beta$ -carotene, lycopene), phenolic acids (such as ferulic acid) and vitamin E. AACCI is moving towards setting a new definition of whole grains that may acknowledge the use of minimal processing to enable good manufacturing practices and enhance food safety of whole grains [5].

Whole-grain-based products are known to reduce the risk of developing cardiovascular diseases (CVD) [6], hypertension [7], metabolic syndrome, type 2 diabetes [8], and different types of cancer. There is a 20% to 40% reduction in the risk of CVD in people who consumed whole grains in their diet. Higher whole-grain intake was associated with a reduced risk of hypertension in middle-aged and older women. Penn State researchers at University Park and the College of Medicine reported a 38 percent decrease in C-reactive protein levels in the blood of individuals on whole grain diet [9]. A high level of this inflammatory marker is thought to place patients at an increased risk for diabetes, hypertension and cardiovascular disease. Whole-grain products may also help in management of weight and reducing obesity. Conflicting results have been obtained so far regarding the role of whole grains in reducing obesity. One study reported that there exists an inverse relationship between whole-grain consumption and BMI (Body Mass Index) and risk of overweight and obesity in men as well as in women [10]. A study from USDA, Human Nutrition Research Center on Aging (HNRCA) in Boston, Massachusetts, involving 5 cohorts, (76912 subjects) reported that whole grain consumption is associated with less weight gain, central adiposity and risk of obesity [11]. But some studies have failed to show any significant relationship between consumption of whole grains and obesity [12]. More research efforts are needed to come up with concrete evidence in support of whole grains in the battle against obesity.

Today, foods made with whole grains are recognized as important sources of nutrients. The health benefits of whole grains are well documented. But many consumers and health professionals are unaware of the health benefits of whole grains. I think open access format is the best way to make people aware of the importance of whole grain cereals in fighting obesity. I am confident that the “Journal of Obesity & Weight loss Therapy” from OMICS Group will play a key role in this direction.

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