
16 Whole Grains and Metabolic Syndrome

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16.1 INTRODUCTION

Whole grains are cereal and pseudocereal grains that contain the germ, endosperm, and bran fractions, in contrast to refined grains, which retain only the endosperm. Therefore, the whole-grain concept does not include leguminous seeds, nuts, and seeds. Common whole grains include wheat, maize, oat, brown (medium and long grain) and wild rice, barley—hulled and dehulled (not pearly), spelt (an ancient species of wheat), emmer (awned wheat), einkorn (diploid species of hulled wheat), kamut (Khorasan wheat cultivar), rye, millet, triticale, teff, and sprouted grains as cereals, but also quinoa, amaranth, and buckwheat as pseudocereals. Common whole-grain products include whole-wheat flour, triticale flour, faro, teff flour, rye flour (dark, medium, and light), whole-grain breads (e.g., dark, brown, whole meal, and rye bread), whole-wheat pasta, rolled oats, oat groats, whole-grain breakfast cereals (e.g., muesli), popcorn, cooked porridges (oatmeal or whole wheat), wheat germ, brown rice, bran, cooked grains (e.g., wheat, millet, and roasted buckwheat), and other grain-based foods such as bulgur and couscous (Cleveland et al. 2000).

Today, there are good scientific evidences to say that whole-grain products are protective against weight gain (Kristensen et al. 2011, Mozaffarian et al. 2011), type 2 diabetes (de Munter et al. 2007, Nettleton et al. 2010, Priebe et al. 2008, Schulze et al. 2007, Sun et al. 2010), cardiovascular diseases (CVDs) (Anderson 2003, Anderson et al. 2000, Mellen et al. 2008), and colorectal cancer (Aune et al. 2011). Concerning the metabolic syndrome (MetS), observational studies are less prevalent. MetS includes several impaired physiological mechanisms (obesity, insulin resistance, hyperglycemia, dyslipidemia, and hypertension) that notably aim at identifying subjects at high risk of CVDs since the risk is threefold in such patients (Potenza and Mechanick 2009). In this perspective, it is particularly relevant that whole grains are protective against weight gain, type 2 diabetes, and CVDs.