

IS A CALORIE A CALORIE?

Research suggests that not all calories are created equal when it comes to digestion and absorption.

Research published in the *American Journal of Clinical Nutrition* showed that the number of calories actually digested and absorbed from whole almonds is 20% less than originally thought! Researchers at the U.S. Department of Agriculture used a new method to more accurately measure calories based on bioavailability and found that participants absorbed just 129 calories from a one-ounce (28 grams) serving of almonds, compared to 160 calories per serving that currently appears on the nutrition label. Additional studies are underway to examine how this technique for measuring calories could potentially affect calorie counts for other foods.

Researchers at King's College London investigated the mechanism behind this phenomenon.

15 HEALTHY PARTICIPANTS
CHEWED
— EITHER —
NATURAL OR
ROASTED ALMONDS



The chewed samples were then examined for cell wall integrity using microscopy?

IT WAS FOUND THAT ALMONDS ARE NOT COMPLETELY BROKEN DOWN DURING CHEWING.



The research showed that the **INTACT CELL WALLS IN THE**



to the release of fat from the almonds

RESEARCH SHOWED THAT DURING **SIMULATED DIGESTION, INTACT ALMOND CELL WALLS ARE NOT BROKEN DOWN,** PREVENTING THE RELEASE AND ABSORPTION OF LIPID? This study was done to help better understand the results of almond digestion studies in humans. Human digestion is a complex and dynamic process that may not be entirely replicated by simulated digestion.

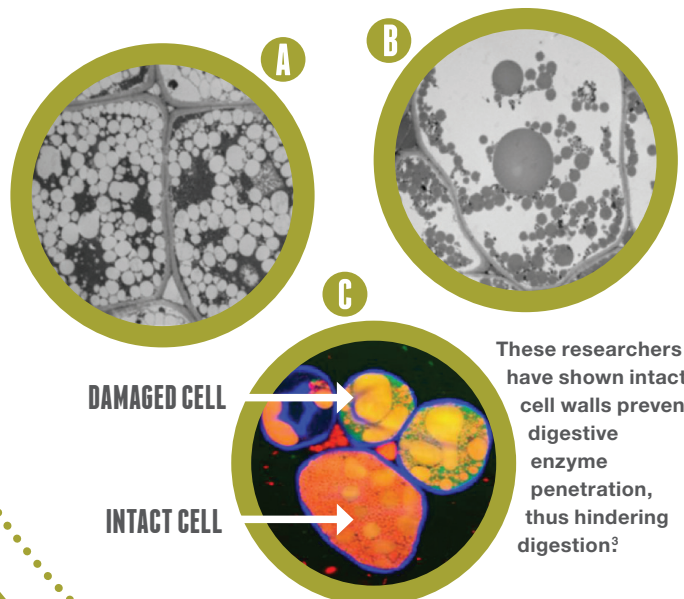
Together these studies help explain earlier findings that whole almonds provide fewer calories than what is currently listed on labels and add to a body of evidence supporting almonds as a weight-wise snack.⁴ To learn more about these or the more than 120 peer-reviewed studies examining the health benefits of almonds, visit Almonds.co.uk

Scientific evidence suggests but does not prove that eating 1.5 ounces per day of most nuts, such as almonds, as part of a diet low in saturated fat and cholesterol may reduce the risk of heart disease.

One serving of almonds (28 grams) has 13 grams of unsaturated fat and only 1 gram of saturated fat.

1. Novotny JA, Gebauer SK, Baer DJ. Discrepancy between the Atwater factor predicted and empirically measured energy values of almonds in human diets. *Am J Clin Nutr*. 2012 Aug;96(2):296-301. 2. Grundy MML et al. Effect of mastication on lipid bioaccessibility of almonds in a randomized human study and its implications for digestion kinetics, metabolizable energy, and postprandial lipemia. *Am J Clin Nutr*. 2015;101(1):25-33. 3. Grundy MML et al. The role of plant cell wall encapsulation and porosity in regulating lipolysis during the digestion of almond seeds. *Food & Function*. 2015 Jan 20;7(1):69-78. 4. Almonds: Nutrition and Scientific Research Summary, updated August 2015; www.almonds.com/nutrition-research.

BELOW: Transmission electron microscopy images of chewed almond boluses. Image A shows intact cells and their content. Image B shows the ruptured cells; note the merged lipid bodies. Image C shows intact vs. damaged cells when exposed to lipid-breaking enzymes (fluorescent green).



These researchers have shown intact cell walls prevent digestive enzyme penetration, thus hindering digestion³