**The need of novel functional dietary fiber and reliable in vitro analyses**

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Introduction

 For many years, the definition of dietary fiber has been subject for debate and discussion. The term “dietary fiber” was first introduced and defined by Hipsley in 1953, as “the non-digestible part of carbohydrates in plants which are used in food”. Research done during the following decennia found a relationship between the intake of dietary fiber and consumer health. Fibers were found to play an important role in prevention of several conditions with huge impact on human society, such as diabetes and coronary disease. These findings lead to new perception of the term “dietary fiber” and resulted in a new set of standards and recommendations by national and international institutions. Simultaneously, as the definition of dietary fiber changed, its method of analysis needed to be revised as well. One of the latest official version for measuring dietary fiber is AOAC 2009.01. Measuring dietary fiber as such provides just a one-dimensional sight. It is of equal importance to pay attention to the fermentation in the colon, as the production of short chain fatty acids play a crucial role in the human metabolism. The role of intestinal micro-organisms (microbiota) has been extensively studied recently and they were shown to play an important role in human health status. Since fibers are a major nutrient and energy source for microbiota in the colon, this opens up a new way of looking at health effects of fibers, not by directly targeting the human host but by modulating intestinal microbiome composition.

An important type of dietary fiber is resistant starch. It can be classified into 4 different categories, ea. RS1, RSII, RSIII and RS IV. RSIV refers to resistant maltodextrins, whereas the other ones refer to the accessibility and crystallinity of the starch in a food matrix, e.g. fruits, bread and grains (e.g. Rice). Measuring dietary in food stuff, turns out to be more difficult as it at first sight seems to be. It turns out that processing and pre-treatment of food has a huge effect on measuring dietary fiber content. We will illustrate this for Dutch white bread and rice.

Furthermore, the importance of dietary fiber in our daily meal, illustrates a growing demand of dietary fiber. It is suspected that in future the amount of conventional dietary fiber (e.g. inulin, pectin’s etc.) will be insufficient to supply the needs. Novel dietary fiber, such as resistant starch, must fulfill this need. Hence it is of importance to enhance its functional properties (e.g. viscosity build up) as the traditional resistant maltodextrins and resistant starch have a lack in viscosity build up.

TNO/Food and bio based research Wageningen, have put a lot of effort in the last couple of years to develop processes that enable to make resistant starch with higher molecular weights as the traditional resistant maltodextrins that are currently produced. This can be achieved via grafting glucose onto starch by use of a polycondensation technique. In this presentation, we will display the reaction conditions for this process and the related analyses regarding molecular weight, degree of resistance towards human digestive enzymes and viscosity properties.

Key words: Novel, dietary fiber, resistant starch, fiber analyses, food pre-treatment, AOAC 2009.01.

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