



Now is the time to promote a new protein measurement method

There is a new method for measuring protein quality. It is more scientifically valid because it more accurately reflects the ability of the body to utilize essential amino acids.

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For nearly 20 years, the world had accepted the PDCAAS (Protein Digestibility Corrected Amino Acid Score) as the gold standard for measuring protein quality. The dairy industry has long argued that this method has flaws and limitations.

At the November 2012 meeting of the International Dairy Federation in South Africa, it was announced that the Food and Agriculture Organization of the United Nations (the same group that adopted the PDCAAS method) has now accepted a new method for measuring protein quality. The new Digestible Indispensible Amino Acids Score method (DIAAS) more accurately reflects the quality of dairy proteins and their ability to complement other proteins.

Paul Moughan, distinguished professor and co-director of the Riddet Institute, New Zealand, explained the issues with the old PDCAAS and the science behind the new DIAAS methods. He also encouraged the dairy industry to get behind this new method by increasing awareness and encouraging implementation of DIAAS beyond FAO.

Let's explore the details of the new method and potential areas of application.

Highlights of the new method

For those who want more details on the new method, Moughan's presentation has been posted on YouTube (<http://ow.ly/fH9XI>). PDCAAS measures fecal crude protein digestibility using a rat model. DIAAS measures the digestibility of individual essential amino acids at the ileum, the end of the small intestine, using a pig model. The new method is more scientifically valid because it more accurately reflects the ability of the body to utilize essential amino acids. Amino acids that enter the colon are modified by colonic microbes and are not available for body protein synthesis.

Under PDCAAS, soy protein isolate, whey protein isolate and milk protein concentrate all had truncated scores of 1.00. Under DIAAS, scores would not be truncated, and typical values would be: soy protein isolate 1.00, whey protein isolate 1.25 and milk protein concentrate 1.31. The new scores reflect the value for ileal digestibility of the limiting amino acid (for example, histidine for whey proteins) and more clearly credit dairy proteins for their ability to complement lower-quality vegetable proteins.

Foods for vulnerable groups

FAO publication of the new method was scheduled for late 2012.

“The proposed change will be significant in nutrition therapy of vulnerable groups living in food insecure environments such as malnourished children, HIV-infected individuals and pregnant or lactating women,” said Véronique Lagrange, U.S. Dairy Export Council, Arlington, Va.

Studies have shown that adding whey or skimmed milk powder to fortified blended foods for vulnerable groups improves the protein quality, allowing a reduction in total amount of protein, which could have potential metabolic advantages. It also allows for a reduction in the content of soy and cereal, both of which contribute potential anti-nutrients.

Other potential applications

Another potential application area is when foods have a protein claim on the product label. For labeling purposes, declaration of the percent daily value is only required when a claim about the protein content of the food is made. If reported, the value must be based on the PDCAAS method. (See 21 CFR 101.9(c)(7)(ii) for details.) It may take some time, possibly years, before the FDA will adopt the new method as part of their regulations.

But for now it's important to realize that adding dairy protein to foods with protein of lower quality can increase the amount of protein that can be claimed on the label.

It would take 1.6 grams of cow's milk protein or 6.2 grams of soy protein to upgrade 1 gram of wheat protein to obtain the preschool-age child's lysine requirement. The DIAAS method also includes a determination of bioavailable lysine.

Another area where protein quality scores are important is for foods that qualify as alternate protein products for school lunch. Schools may use alternate protein products to fulfill all or part of the meat/meat alternate component.

The regulations state that “The biological quality of the protein in the alternate protein product must be at least 80 percent that of casein, determined by performing a Protein Digestibility Corrected Amino Acid Score (PDCAAS).”

Examples of dairy ingredients that can be used in school lunch include nonfat dry milk, whey protein concentrate and cheese powder.

The road to implementation

Moughan's lab has already completed testing for a variety of high-quality proteins. However, he noted that in order for the new DIAAS method to be implemented, it would be necessary to build a larger database with scores for a wide variety of protein ingredients.

There are significant costs associated with the new test method, and until a database is built, it will be difficult to convince other regulatory bodies to adopt the DIAAS method. Armed with this new tool, we can start now to promote the superiority of dairy proteins to the nutrition community. Some interesting and beneficial results. So, yes, we can get what we want as well as what we need.

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