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Short Report

UNDERSTANDING LABEL COMPLIANCE OF HIGH-PROTEIN SPORTS SUPPLEMENTS TO INFORM REGULATIONS

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Background

The place for sports supplements within the current South African legislative framework is currently in discussion. The Department of Health Directorate: Food Control and the Complementary Medicines Council (CMC)'s negotiations on the proposed amendment to the General Regulations Made in Terms of the Medicines and Related Substances Act 101 of 1965 and the draft Regulations Relating the Labelling and Advertising of Foods (R429 of 29 May 2014). The general discussion is to the effect that products outside of capsules, tablets and soft gels will in future be labelled as foods, and thus fall under the jurisdiction of the current Regulations Relating the Labelling and Advertising of Foodstuffs (R.146 Of 1 March 2010). However, food making medicinal claims will fall under the medicines Act 101 of 1965 as a complementary medicine. Against this background it is important to understand current claims and label compliance of meal-replacement supplements within South Africa to comprehensively inform these discussions.

Protein is considered the most expensive nutrient in the food chain, and has been topping the *popular ingredient* list for some time. With this background, the current study focused on the label compliance of 70 different protein supplements available on the South African market determined through a comprehensive research project at the University of Pretoria.

Methodology overview

An extensive list of protein supplements available on the South African market was populated by the research team (n=110) in December 2014, through a survey conducted at the leading pharmacies, retail-groups and online stores. From this list, 70 products were selected for further testing.

Convenience sampling was performed at various undeclared retailer locations, and two samples of each product, each with a different batch number, was purchased by independent researchers on different days. Products were treated in a similar, optimal manner prior to sample handing. Of each batch, two duplicate samples were drawn and transferred to containers coded with random codes to eliminate bias.

Subsequently, these samples were transported under ideal conditions to a SANAS accredited testing laboratory where nutritional analyses were performed. Moisture, ash, nitrogen (Dumas method), glycaemic carbohydrates, total sugars (glucose, fructose, sucrose, lactose and maltose), total fat, fatty acid composition, sodium and energy (by calculation) were determined.

Protein was calculated as nitrogen multiplied by the conversion factor of 6.25 (Jones factor), used for mixed sources of protein. In addition, products for which the ingredient lists only declared dairy sources of protein, the conversion factor of 6.38 was applied to convert analysed nitrogen to protein as is allowed according to the current label regulations in South Africa (Greenfield & Southgate, 2003; R.146 of 2010).

Results were tabulated and compared to labels. Results obtained were statistically compared to that presented on the product labels through a two-sample statistical unequal variance (heteroscedastic) t-Test, with a two-tailed distribution. Percentage difference between the mean of the analysed values and the value declared on the label was also explored. Percentage difference is often used as the guideline for compliance within labelling regulations. To provide context, percentage differences between analysed protein values of skim milk powder (n=92) and whey powder (n=40) and the values reported in the Agricultural Product Standards Act (Act No. 119 Of 1990) were also investigated.

Label compliance of the protein content of sports supplements aimed at muscle gain

According to the guidelines of the Regulations Relating to the Labelling and Advertising of Foodstuffs for Compliance Purposes (Guideline 5, R.146 of 1 March 2010), a tolerance of 25% is allowed for nutrient declaration of protein if the product contains more than 10g protein per 100g.

Percentage differences between labelled protein content and the mean analysed values in the current study ranged from 0.5% to 80%. The mean percentage difference of the complete study sample (n=70) was 10%. The results can be compared to a study done on skim milk (n=92 samples) and whey powder (n=40 samples). Percentage differences of analysed protein content of the samples compared to the values for protein regulated by the Agricultural Product Standards Act (Act No. 119 Of 1990) Regulations Relating to Dairy Products and Imitation Dairy Products, varied between 2%

and 12% for skim milk powder, and 14% and 38% for whey powder. The data provides insight on the natural variability in protein content of the ingredients often used within sports supplements.

From the 70 sports supplement products included in the current study, 5 products over-reported protein content by more than 25%. Of these 5 products, 1 was obtained from Dis-Chem. The mean analysed protein value of the product was 44% less than that declared on the product label. The other 4 products were from two specific brands obtained from other stores. These 4 products contained 80%, 77%, 52% and 42% less protein than that declared on their labels, respectively.

The use of different protein conversion factors

Crude protein has since the development of the proximate system been calculated by multiplying total nitrogen (N) by a certain factor. The general factor used is 6.25 based on the assumption that proteins contain 16% nitrogen. It is however known that certain proteins contain more, and other less, nitrogen. Jones, Munsey and Walker (1942) measured nitrogen content of a wide range of isolated proteins, and their factors have been widely adopted when specific single source proteins are used as ingredients within food products. The Regulations Relating to the Labelling and Advertising of Foodstuffs (R.146 of 2010) also allows the use of specific factors if a single source of protein is used during manufacturing.

The use of such specific conversion factors in addition to the generally accepted factor of 6.25 was explored. The more precise factor of 6.38 was applied to 10 of the products which declared only dairy ingredients as sources of protein in their QUID label declarations. The results of this increased the analysed protein content values of the 10 products slightly, although no noteworthy difference in terms of tolerance was observed in comparison to declared label values of these products.

Conclusions

Recommended tolerances for nutrient declarations in nutrition labelling are regulated by the Guidelines of the Regulations Relating to the Labelling and Advertising of Foodstuffs for Compliance Purposes (Guideline 5, R.146 of 1 March 2010). Five products tested outside the regulated tolerance value of 25% for protein, and warrants further investigation. The remaining 65 products analysed were in-line with the tolerance value, with percentage differences between the analysed means and protein label values ranging between 0.5% and 24%.

Research team

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- Dr Beulah Pretorius. Research Consultant. PhD Nutrition, MSc Biochemistry, University of Pretoria.

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