



PROTEIN



Lab Tests vs Label Claims Protein Supplement Product Survey

US (2022)

A trusted verification program for protein supplements

Consumers have many reasons to add protein-based supplements to their diets, with goals such as improving general fitness, supporting weight management, and the promotion of muscle growth. Protein supplements are used by a wide range of consumers, from both amateur and elite athletes through to general consumers and those with specific dietary needs.

The interest in these supplements is greater now than ever. The global protein supplements market is worth over \$22 billion, with expectations to nearly double by 2030; the US market alone generated \$8.4 billion in 2021¹.

Protein powders are the biggest sellers, with ready-to-drink products in second place. Animal-based (whey, casein, egg, etc.) and plant-based (soy, pea, etc.) protein supplements are both readily available.

These products, historically used by athletes and bodybuilders, have experienced increased demand as a wider customer base has emerged, fuelled by lifestyle and recreational users.

**Making protein level testing
an *exact science***



¹ Grand View Research. (2022, February). Protein supplements market size report, 2021-2030. Protein Supplements Market Size Report, 2021-2030. Retrieved March 31, 2022, from <http://www.grandviewresearch.com/industry-analysis/protein-supplements-market>

Nutrition Facts Label

Whether the consumer is intending to increase muscle mass, meet protein needs as they age, compensate for the absence of protein-rich food from their diet, or to promote satiety to support weight loss, it is important to know how much protein is in the supplement products being consumed. Counting macronutrients, or “macros”, has also been popularized in recent years, wherein individuals design their daily nutrient intake based on a certain percentage of carbohydrates, fats, and protein.

In all of these situations, the consumer relies on the protein content declared on the Nutrition Facts label.

Nutrition Labels & The FDA

The US Food and Drug Administration (FDA) requires that nutrient values be declared on the Nutrition Facts label of dietary supplements, and protein, when present at a content greater than one gram, is required to be declared on the nutrition label expressed to the nearest 1 g increment².

Food and supplement manufacturers are responsible for assuring the validity of nutrient values which appear on a products' Nutrition Facts label, however, the FDA does not dictate how a company determines this information. In practice, these values are typically determined either by laboratory testing of the product prior to its release in the marketplace or by using the product formulation and database software to estimate theoretical nutrient values.

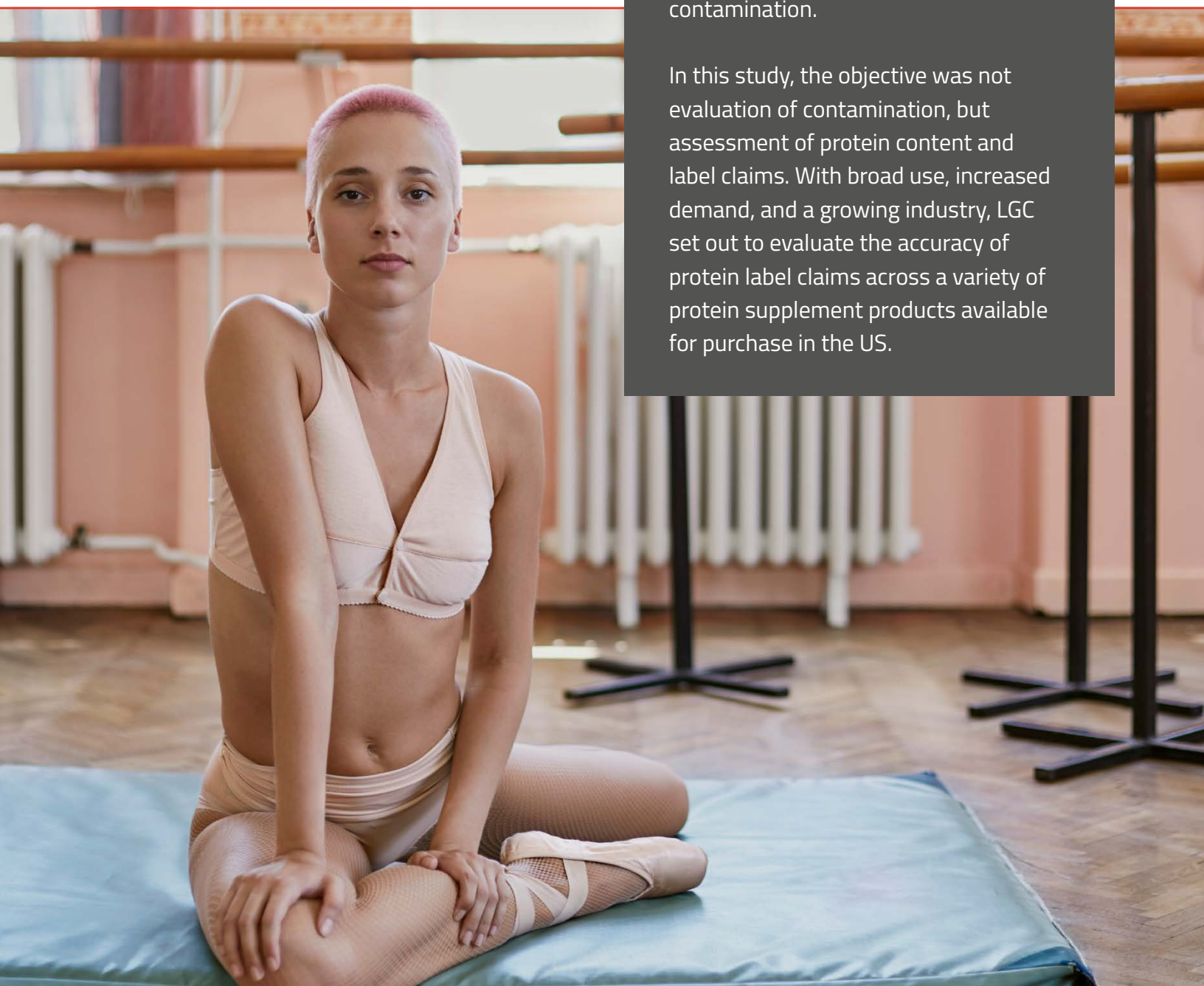


² Food and Drugs, 21 C.F.R. § 101.9(c)(7) (2012).



Over the years, LGC has conducted several analytical surveys of supplement products as part of its ongoing support of supplement manufacturers, athletes and general consumers, especially in association with managing risks associated with supplement contamination.

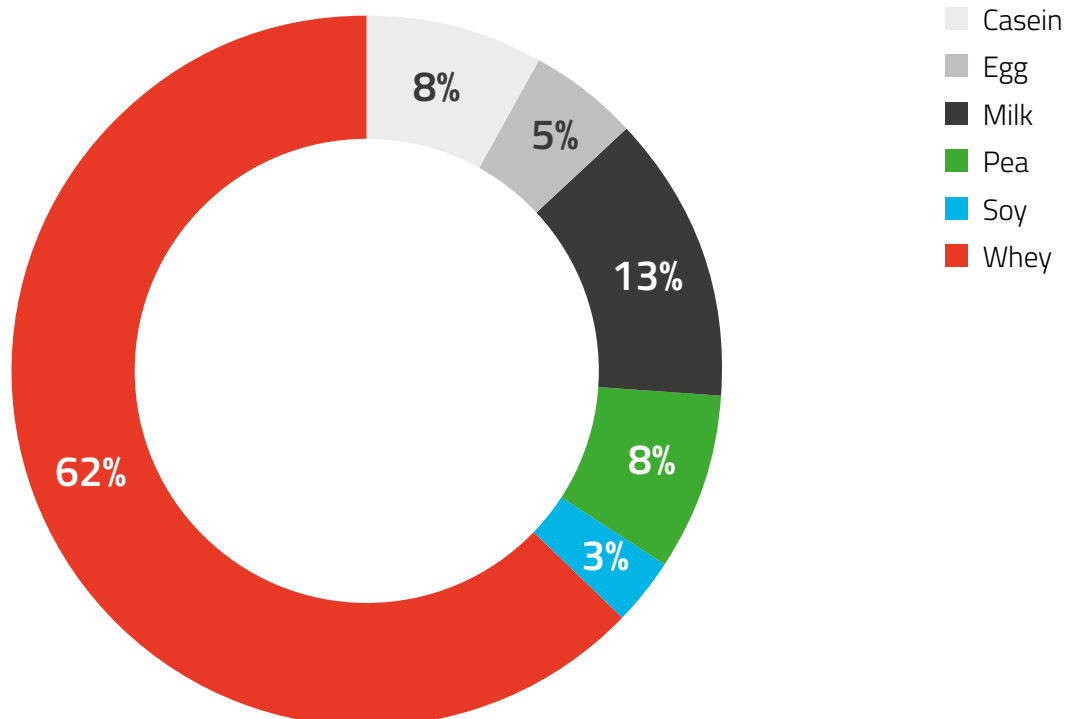
In this study, the objective was not evaluation of contamination, but assessment of protein content and label claims. With broad use, increased demand, and a growing industry, LGC set out to evaluate the accuracy of protein label claims across a variety of protein supplement products available for purchase in the US.



Tested Products

- **61 products** were acquired from online retail outlets and traditional brick and mortar stores.
- **35 brands** were selected, including those marketed specifically toward general consumers and those targeted at athletes.
- A variety of protein sources were included in the survey: **casein, egg, milk, pea, soy and whey**. Due to availability and popularity, the majority of products were whey protein-based (62%) or milk protein-based (13%) (mixture of milk and/or whey protein and/or casein).
- The survey focused on protein powders and ready-to-drink protein beverages. **90% of products** tested were protein powders, 10% were ready-to-drink beverages.

Protein Sources Tested



*Percentages may not add up to 100% due to rounding.

Testing

All testing was performed using methods validated to meet ISO17025 requirements. The products were tested using a dedicated elemental combustion analyzer, measuring both carbon and total nitrogen.

The amount of protein in each product was calculated using the determined nitrogen (N) value, a protein source-specific nitrogen-to-protein conversion factor, and the serving size declared on the product label, in the following manner:

$$\text{Protein per serving (g)} = (\text{N content (g/100g)} / 100 \times \text{nitrogen-to-protein conversion factor}) \times \text{serving size (g)}$$



When comparing the determined protein content to the product label claim, measurement uncertainty of the analytical procedure (determined during validation) and FDA rounding allowances for the labelling of protein (as outlined above) were taken into consideration. This ensured that the results calculated through the analysis process were aligned with FDA label requirements.

The results were reviewed against current protein content acceptance criteria for the Informed Protein testing programme and thus were converted to % of pack claim, wherein a product shown as 100% of pack claim was found to have protein content that was consistent with the claim on the Nutrition Facts label.

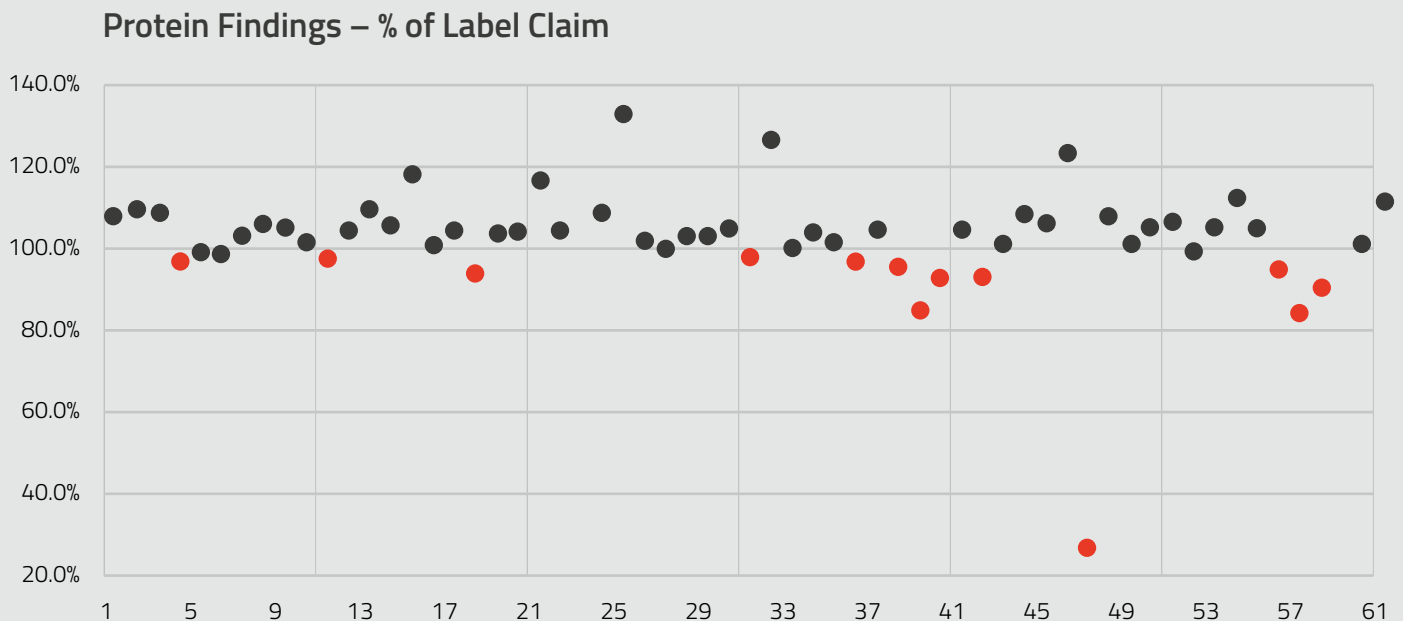
Test results were evaluated against criteria that required the measured protein to be greater than or equal to 98% of the claim on the product label. This criterion was chosen to ensure a balance between consumer expectation (i.e. products meeting label claim) while allowing a tempered extent of variation that may reasonably be seen in the market.

Products were also screened for a range of known adulterants and free amino acids to identify nitrogen-rich compounds that may be included as ingredients in the product. This study did not include a process to verify that these compounds were part of the product formulation (for example free amino acids as part of a proprietary ingredient blend) and so, to avoid possible protein content misinterpretation, products where these compounds were detected were excluded from the results.

Supplement Product Survey

Findings*

Out of 61 products tested, 13 were found to have protein content that was less than 98% of the claim on the Nutrition Facts label. The findings were observed across three different protein sources (whey, pea, and egg). These products spanned across nine different nutritional supplement brands.

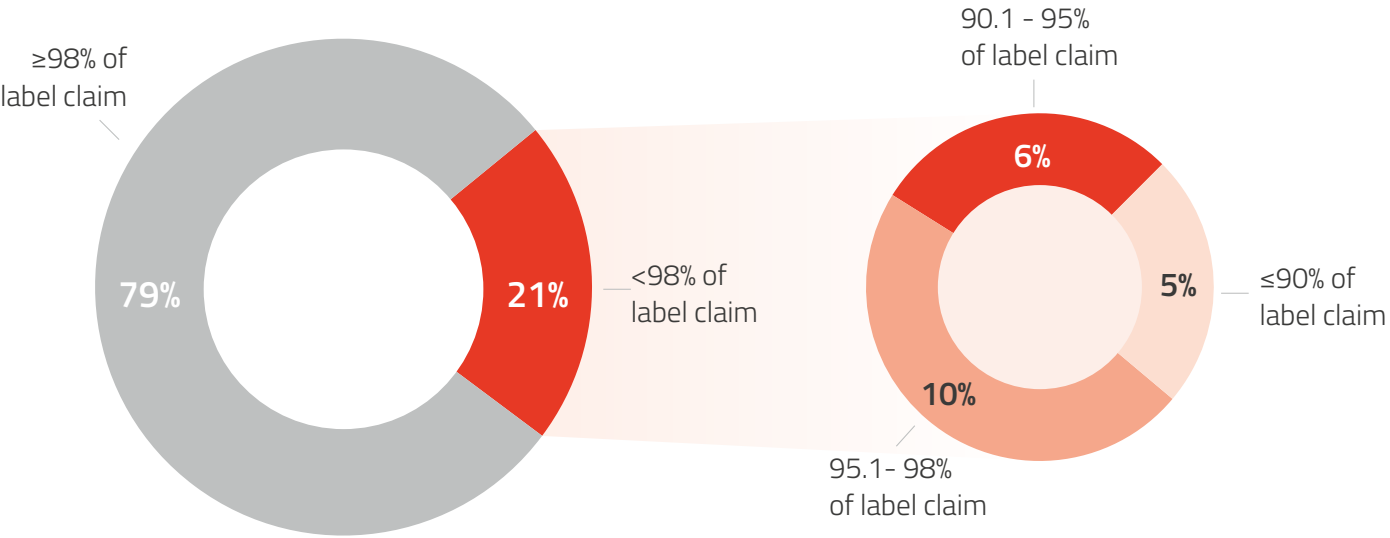


Of the 21% of products that were found to contain less than 98% of the protein claimed on the product label can be broken down as follows:

- **10%** showed protein levels that were **95.1 – 98%** of label claim
- **6%** showed protein levels that were **90.1 – 95%** of label claim
- **5%** showed protein levels that were **less than or equal to 90%** of label claim

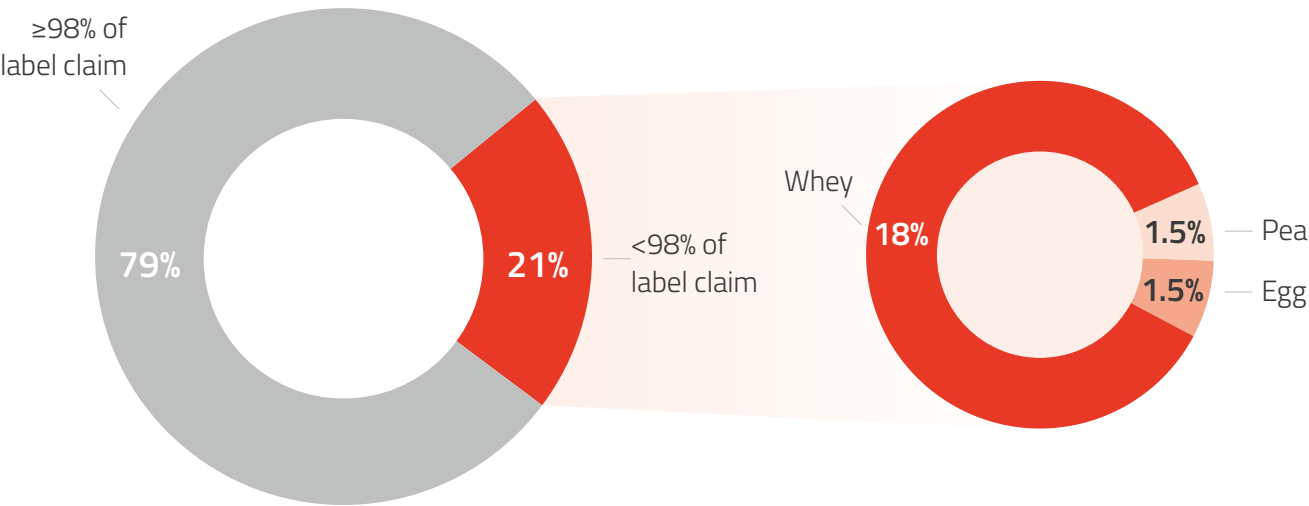
*Supplement Product Survey v.3 - Updated due to revision of Nitrogen Factor used in respect of soy-based products to reflect industry standards.

Protein Findings – % of Label Claim



The majority of the products that failed to meet survey criteria (noting bias which may be attributable to product type distribution) were whey protein products.

Protein Findings – Protein Source



Test results were evaluated against criteria that required the measured protein to be greater than or equal to 98% of the claim on the product label.

Results

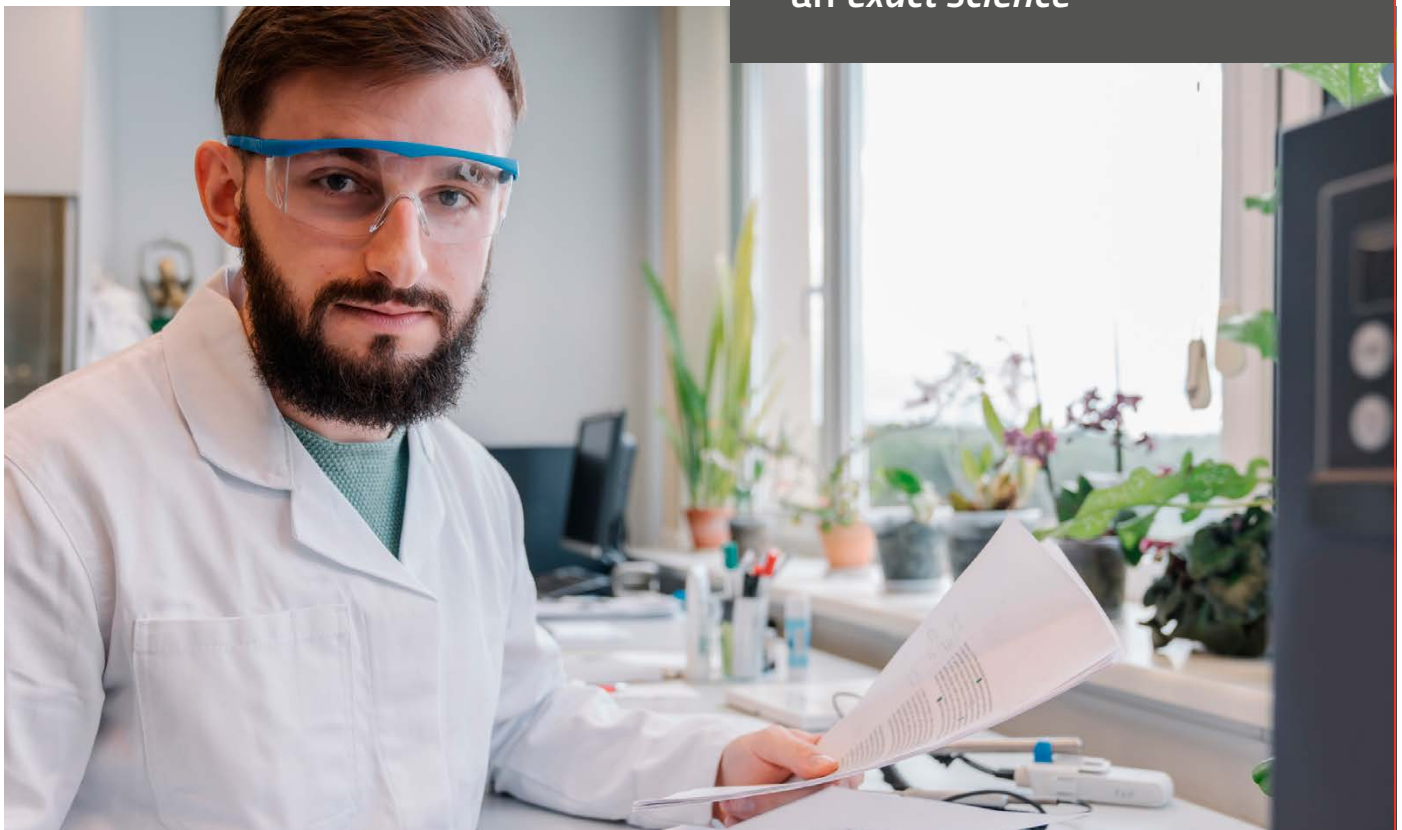
Of the three egg protein products that were included in the survey, one product was shown to contain only 27% of the protein amount claimed on the Nutrition Facts label. This product, purchased online, was advertised to contain “100% Egg Protein” with a claim of 24 g of protein per serving. Testing showed that the product contained less than 7 g of protein per serving.

This result was replicated with a second product order. Relying solely on the information from the Nutrition Facts label, a consumer would be led to believe that a single serving would deliver the claimed amount of protein, however, these results indicate that a user would have to take in more than three times the recommended serving in order to consume the intended amount.

The consumer who purchases this product would not only be underestimating their protein intake, but they would also be misled into overpaying for the amount of protein they would receive. This finding also calls into question the overall integrity of the product.

‘One product was shown to contain only 27% of the protein amount claimed on the Nutrition Facts label’

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Results continued

There were six instances among the whey protein products included in the survey where there was more than one product included from a single brand.

These results are shown in the below table and highlight an inconsistency in results from some brands that were included in the survey. While one brand was shown to have acceptable results for all of the products that were included in the survey, the other

brands in this scenario had at least one of their whey protein products fail to meet the criteria of the survey (contained protein at a level less than 98% of the claim on the label). The variability of these findings, highlight issues with consistency of production or product formulation across a variety of brands. Even within a single brand this shows evidence for product-to-product variation in the accuracy of the protein content as reported on the Nutrition Facts label.

Results where multiple whey protein products from single brands were tested.

(Masked)	# of products in survey	# of products <98% of label claim	% of products <98% of label claim
A	3	1	33%
B	3	0	0%
C	2	1	50%
D	2	2	100%
E	2	1	50%
F	3	3	100%

*These products were shown to contain protein at a level less than 98% of the claim on the label after both measurement uncertainty of the analytical procedure and FDA rounding allowance has been taken into consideration.

Challenge

This survey highlights a potential challenge and risk that consumers and athletes face when purchasing and consuming protein-based supplements.

Of the 61 products tested, 13 were found to have protein content that was less than 98% of the claim on the Nutrition Facts label.

The findings were observed across three different protein sources (whey, pea, and egg) and across nine different supplements brands.

Many of the products included in this survey met or exceeded label claims. However, this survey shows that the information on the Nutrition Facts label was unreliable in 21% of the products tested and points to a consumer risk in the purchase of a protein-based supplements.

With only the information on the Nutrition Facts label the user may purchase and consume an unknowingly low amount of protein. Depending on the degree of the inaccuracy or the criticality of the protein need, this could have serious consequences.

Reliance on a 'reputable brand' or assurance that one product in a brand's product mix meets expectations does not even appear to offer security, as evidenced by within brand product-to-product variation in the accuracy of the protein content.



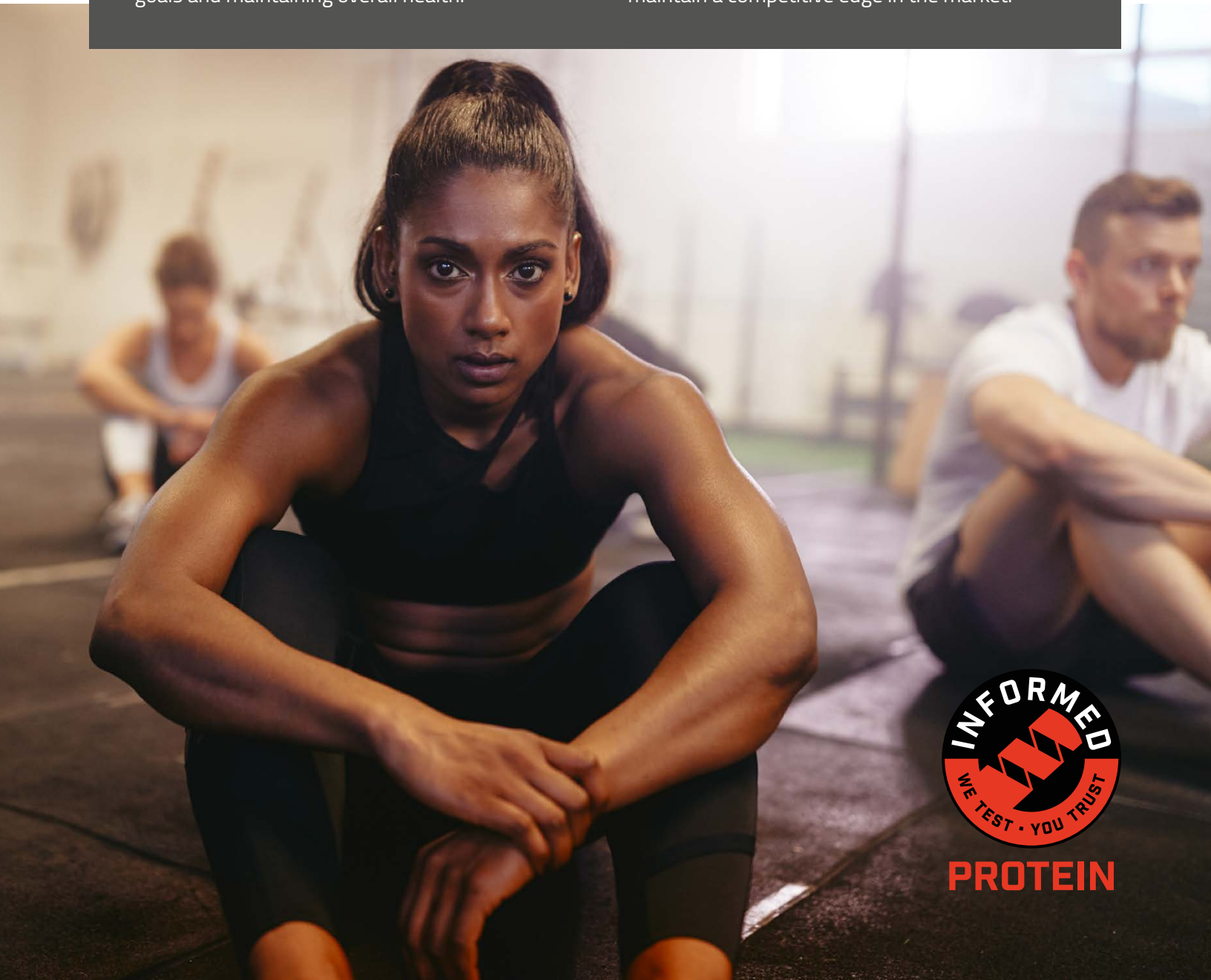
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Conclusion

Verifying protein levels in supplements is crucial for both manufacturers and consumers.

From a consumer perspective, verified protein levels ensure they are receiving the nutritional benefits they expect. Especially for athletes and individuals with specific dietary needs, accurate protein intake is essential for achieving fitness goals and maintaining overall health.

For supplement brands, accurate protein labelling builds trust and reinforces brand integrity. Precise protein quantification allows for accurate nutritional information, enabling businesses to provide reliable data to their customers and maintain a competitive edge in the market.



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