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Editorial: Producing foods and ingredients through valorization of agro-industrial by-products

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Editorial on the Research Topic

[Producing foods and ingredients through valorization of agro-industrial by-products](#)

There are currently a number of factors that prompt us to question or rethink our food systems (Eames-Sheavly et al., 2011): rapid population growth; disparity in access to nutrients, due to a lack or an inadequate balance of them; changes in consumption habits; scarcity of certain natural resources, and the non-use of others; and the significant amount of food that is thrown away (Global Panel on Agriculture and Food Systems for Nutrition, 2016). Another important factor is the volume of by-products that many agro-industries generate, which are discarded as waste, directly impacting the environment (Sanchez Lopez et al., 2022), (Rumaihi et al., 2020).

More information is needed about the new paradigm of staying healthy through food and, as a society, evaluating whether our diet is sustainable. Subsequently, it will be necessary to improve traditional foods so that they sustainably fulfill the role of keeping us healthy while respecting the customs and habits of our population (WHO, 2020). Making security and nutrition a central priority when assessing the sustainability of food systems will help break the vicious cycle of malnutrition and disease, and help policymakers turn data into action (World Health Organization, 2022). Linking this priority to food sustainability systems is the search for value alternatives, such as by-products generated and discarded by agro-industries.

Approximately 38% of total food waste generated arises during its processing (Helkar et al., 2016), after which it is discarded, incurring disposal costs and negatively impacting the environment. In many cases, these by-products are rich in nutrients such as dietary fiber, protein, and antioxidants, which can improve the nutritional profile of mass-consumption foods. Thus, there is growing interest in revaluing the large quantities of waste generated by agro-industries, and the development of nutrient-rich foodstuffs from these by-products warrants further investigation. However, this revaluing concept presents some challenges in terms of incorporating the ingredients into the formulation and analyzing how well consumers understand and appreciate the idea.

With this in mind, these new ingredients and foods need to be characterized in terms of their techno-functional, physicochemical, and structural properties, nutritional and biocompound profiles, bioaccessibility, sensory characteristics, consumer response, etc.

This Research Topic in *Frontiers in Food Science and Technology* includes four studies (one review and three research articles) that examine by-products of vegetable and animal origin. The review carried out by [Hosseinineyad et al.](#) provides an updated summary of the main bioactive compounds in persimmon, such as fiber, phenolic compounds, and carotenoids, that are responsible for its antioxidant properties. Additionally, the potential use of persimmon surpluses and by-products in developing new persimmon-derived products is addressed. In this regard, the main studies on dried persimmon, the use of persimmon flour in pork liver pâté and pasta formulation, the preparation of ice cream and dairy products formulated with persimmon, and persimmon-derived puree, juice, vinegar, and wine are surveyed.

[Lopez Bermudez et al.](#) investigated two valorization strategies for using a by-product of tomato processing as a functional additive in food processing. The first approach consisted of carotenoid extraction using ultrasound-assisted extraction, and the encapsulation of the extract using spray-drying technology. The second one evaluated the potential use of tomato peel as a replacement for fat and flour in cookie preparation. Both strategies have the potential to enhance public health using a residue that is often discarded.

Brewer's spent grain (BSG) is usually considered as waste, but it could be used as a functional ingredient. [Curutchet et al.](#) analyzed consumers' attitudes towards different BSG-added food products, such as bread, chocolate milk, and pasta, under informed conditions. They found that the best consumer response occurred when the label displayed a sustainability logo, a fiber source claim, and a description of BSG.

References

- Eames-Sheavly, M., Hadelkel, C., McGregors Hedstrom, A., Patchen, A., Stewart, R., and Wilkins, J. (2011). *Discovering our food system*. Ithaca, New York: Cornell Univ. Dep. Hortic.
- Global Panel on Agriculture and Food Systems for Nutrition (2016). *Food systems and diets: Facing the challenges of the 21st century*. London. ISBN 9780995622807.
- Helkar, P. B., Sahoo, A., and Patil, N. (2016). Review: Food industry by-products used as a functional food ingredients. *Int. J. Waste Resour.* 6, 1–6. doi:10.4172/2252-5211.1000248
- Rumaihi, A. A., Mckay, G., Mackey, H. R., and Ansari, T. (2020). Environmental impact assessment of food waste management using two composting techniques. *Sustainability* 12, 1595. doi:10.3390/su12041595

Therefore, this study confirmed the importance of the fiber source and sustainability claims. Moreover, BSG-enriched pasta was the product most widely accepted, followed by bread and chocolate.

Finally, [Bauer-Estrada et al.](#) propose valorizing whey and using it in a scaled-up food-grade culture medium. Using an *in vitro* digestion model, the authors evaluated the utility of the medium for protecting probiotics against gastrointestinal conditions. Such a medium could be used as a low-cost alternative for growing probiotics that will subsequently be incorporated into food.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- Sanchez Lopez, J., Patinha Caldeira, C., De Laurentiis, V., Sala, S., and Avraamides, M. (2022). Brief on food waste in the European union. Available at: https://joint-research-centre.ec.europa.eu/publications/brief-food-waste-european-union_en (Accessed on October 13, 2022).

- WHO (2020). *FAO/WHO sustainable healthy diets- guiding principles*. Rome. ISBN 9789251328453.

- World Health Organization (2022). Malnutrition. Available at: <https://www.who.int/news-room/fact-sheets/detail/malnutrition#:~:text=Globally> (Accessed on October 13, 2022).