

**Session Biosphere: April 12th 11.30 hrs**

**1s2 Healthy foods produced in circular food systems**

## **Healthy and sustainable diets: providing nutrition, not only nutrients**

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The primary purpose for the food system is abundantly clear: providing healthy diets to a world population within planetary boundaries. However, the routes towards this goal are less clear and heavily debated. Within this context, replacing animal-based products with plant-based products is often advocated, but such recommendations are often made on the reductionist consideration of animal-based products as only protein source, and failing to consider the broader context of nutrients and nutrition provided by food products. Therefore, product-for-product replacement based on a single nutrient may lead to further impact in the diet, leading to nutrient deficiencies. Furthermore, it is important to keep in mind that nutrients in food products should not only be considered quantitatively (i.e., the concentration of a nutrient) but also qualitatively (i.e., is the nutrient present in the right form to contribute to nutrition). Key examples of qualitative aspects of nutrition include the bioavailability of minerals and the amino acid composition and digestibility of proteins. For minerals, notable differences for bioavailability of Ca, Zn and Fe are seen between different food products. For instance, bioavailability of Ca may be as low as only 5% in some vegetables rich in phytates or oxalates, whereas dairy products supply high amounts of calcium with much higher bioavailability (30-40%). Zinc bioavailability from phytate-rich foods is also notably lower, but can be increased if complimentary foods such as milk are consumed together with e.g., rice or bread. Also, for protein quality, notable differences are seen between different protein sources, both in terms of amino acid composition, but also protein digestibility. While animal proteins (e.g., meat, dairy, eggs) typically provide all required amino acids in sufficient amounts and are highly bioavailable, many plant proteins are deficient in one or more essential amino acids and have lower digestibility. Particularly lysine is an amino acid of concern. Failure to consider protein quality can thus lead to protein malnutrition despite sufficient protein intake. Healthy diets included providing nutrients in digestible and bioavailable to ensure that they can contribute to nutrition and human health. Such aspects, however, appear to be readily overlooked in many, sometimes polarizing, discussions on the topic of healthy and sustainable diets, with the risk of quality of diets becoming deprioritized. Balanced considerations of configurations of potential future food systems including not

only the provision of nutrients, but also nutrition, is therefore essential to safeguard human health for now and generations to come.

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*Keywords: Protein, calcium, nutrient, bioavailability, nutrition*