



## *Editorial*

### **Thoughts about food security, food loss and waste and what has to be done**

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A lot has been published, reviewed and discussed about food security, or should we say, food insecurity, however, success in addressing this challenge has been only to a limited extent. A few weeks ago, the FAO has released its 2021 report “The State of Food Security and Nutrition in the World” and its message is loud and clear: we are not meeting our goal and commitment to eradicate world hunger and malnutrition in 2030. The report indicates that as a result of the COVID-19 pandemic, world hunger has actually increased by 1.5% in 2020, reaching a hunger level of about 9.5%. The data that the report depicts is alarming: about 2.7 billion people did not have access to enough and appropriate food in 2020 and about 12% of the global population suffered from severe food insecurity in 2020. In 2020, about 420 million undernourished individuals were from Asia and 280 million were from Africa. The data about children is even more alarming: in 2020, about 150 million children younger than 5 years (22%) were affected by stunting, about 45 million (9.5%) suffered from wasting, and about 39 million (5.7%) were overweight; most (~90%) of the malnourished children live in Asia and Africa. The recent FAO report highlights the severity of the food security and nutrition state of the world and makes it clear that “business as usual” is not an option and that bold approaches and measures have to be developed and implemented ASAP in order to reverse the course and overcome the dire challenges. I would like to argue that addressing some of the challenges that are associated with food loss and generation of food waste along the food supply chain can offer some tangible means to successfully meet some of the challenges of food security. It has been established that between 20 and 45% of the agricultural and food products is lost and wasted, in many cases even before reaching the market. For example, 45% of the fruits and vegetables, 35% of all fish and seafood, 30% of all dairy products, and 20% of all meat and poultry is lost and/or become waste, before consumption. Data that has been published by the FAO indicates that about 30% of the world’s food is squandered. Every year we waste about 1.3 billion tons of food

that has a monetary value of about 1 trillion US Dollars. Food loss and waste generation occurs throughout the continuum from the field/farm to consumption. The distribution of losses along the supply chain varies among countries and continents. For example, in developing and underdeveloped countries about 50–75% of the loss is associated with food production, handling and storage, while in developed countries, 50–60% of the loss and waste is associated with the distribution, marketing and consumption of agricultural and food products. A significant reduction in food loss and waste generation can effectively increase the amount of food that is available and consumed and thus can allow mitigating, to a certain extent, the food security and human nutrition challenges. The latter requires developing and implementing integrated approaches that address the multi-facet nature of food loss in a product- and country-specific manner.

As an example, let's discuss milk production, processing, marketing and consumption. The global milk production in 2020 was 906 million tons, out of which about 721 million tons were of bovine milk. Using the afore-stated data, about 216 million tons were discarded as milk and dairy products loss and waste. This amount of unconsumed milk contained 4.72 million tons of proteins, 6.66 million tons of lactose, 5.66 million tons of lipids, 0.86 million tons of minerals and, 126 million tons of water. Obviously, the latter is in addition to all the natural resources, capital and labor that have been lost with the discarded milk and dairy products. Based on the RDA standards of the FAO, the afore-detailed amounts of discarded proteins and lipids represented the annual protein and lipid requirements of 128 and 191 million people, respectively, AMAZING! The amount of water that was discarded with this milk equaled the amount of water that is used annually by 1 million people! Applicable approaches that can reduce loss of milk and dairy products at different segments of the milk supply chain exist. Success in significantly lower milk loss and waste requires establishing an integrated, multi-disciplinary platform that can effectively address all aspects of milk production, milk handling, milk storage and processing, marketing and storage of dairy products, as well as consumption of dairy products. This platform has to be developed and implemented by milk producers, milk processors, veterinarians, animal nutritionists, milk processors as well as food scientists and engineers. The involvement of NGOs, local, state and federal governments as well as of international organization is critically needed as well. Such an approach has to enhance the quality of raw milk, implement means to slow down the inherent deterioration of raw milk quality, enhance milk handling and cold storage capabilities, as well as develop technological approaches for processing of surplus milk. It has also to absolutely ban milk dumping, extend the quality and shelf life of dairy product, and significantly enhance the infrastructure and details of the cold delivery chain. Meeting these goals not only will enhance the profitability and well-being of the dairy industry, it will also direct increasing amounts of milk and dairy products to human consumption, thus addressing some of the food security challenges.

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