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FRUCTANS COUNTERACT ROS IN PLANTS, IN FOOD AND IN THE HUMAN BODY

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Fructans are fructose-based oligo- and polysaccharides accumulating in the vacuoles of a number of plant species (e.g. wheat, chicory). Since long, they are recognized as water-soluble reserve compounds that can be quickly remobilized to sustain growth. They are also believed to increase plant stress tolerance, and act as osmoregulators and sink strength regulators. Fructans are also gaining importance as prebiotics to improve health. Recent data on transgenic plants carrying fructan- and other sugar biosynthetic enzymes strongly suggest that sugars can also act as scavengers of reactive oxygen species (ROS) *in planta*. This antioxidant activity is confirmed by *in vitro* measurements. Models are presented to explain how vacuolar antioxidant mechanisms might cooperate with the more classic, cytosolic antioxidative defence mechanisms. The dual character of fructans, acting both as prebiotics and as antioxidants, make them even more promising for future use in functional foods. Their antioxidant properties are highlighted along the gastrointestinal tract. Novel insights strongly suggest that they might not only contribute to general health and well-being, but likely they also counteract ROS-based diseases (e.g. cancer), prevent outbreak of pathogens (e.g. *Salmonella*) and, in combination with restricted caloric intakes, they might even contribute to longevity.