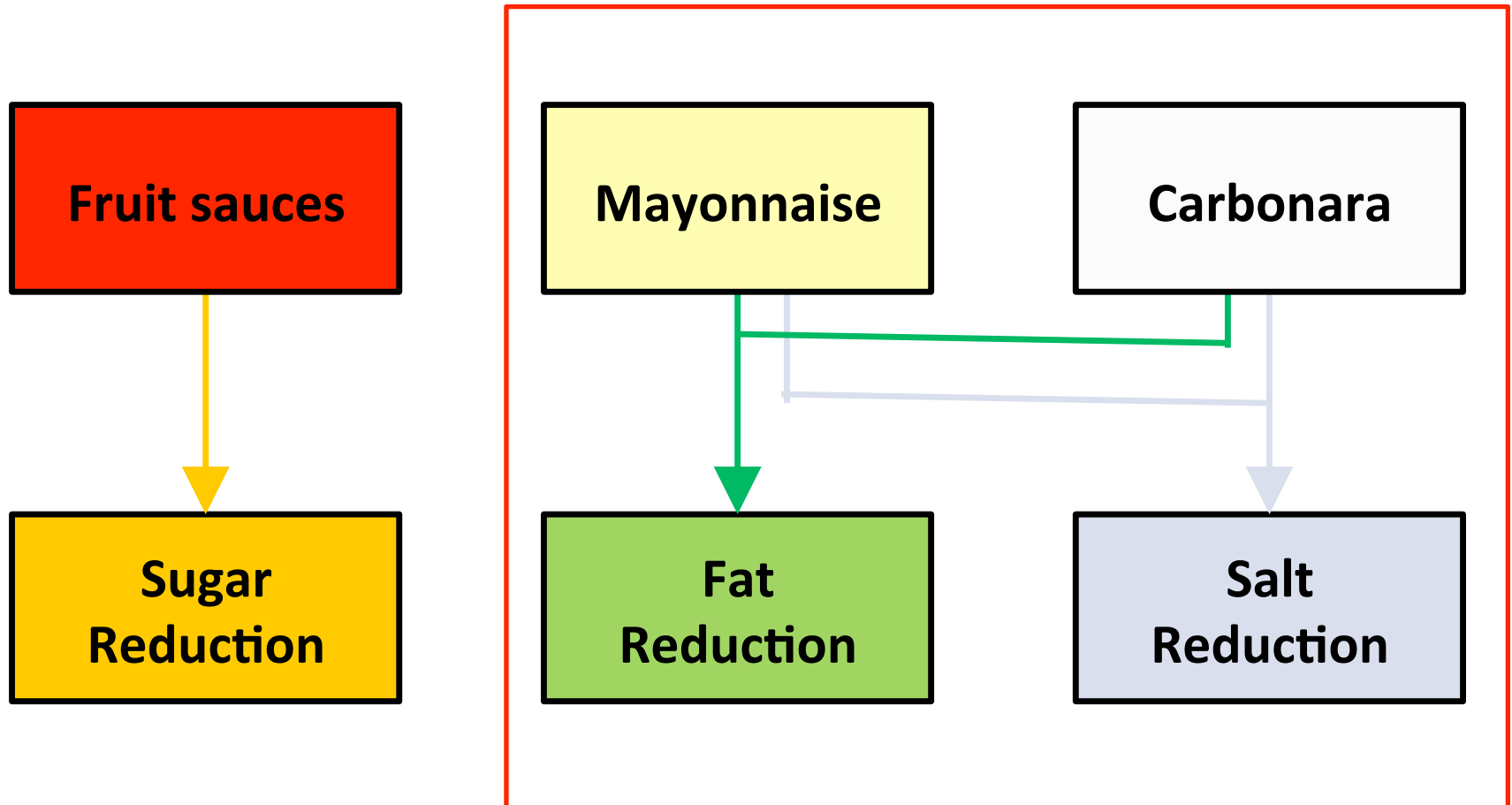


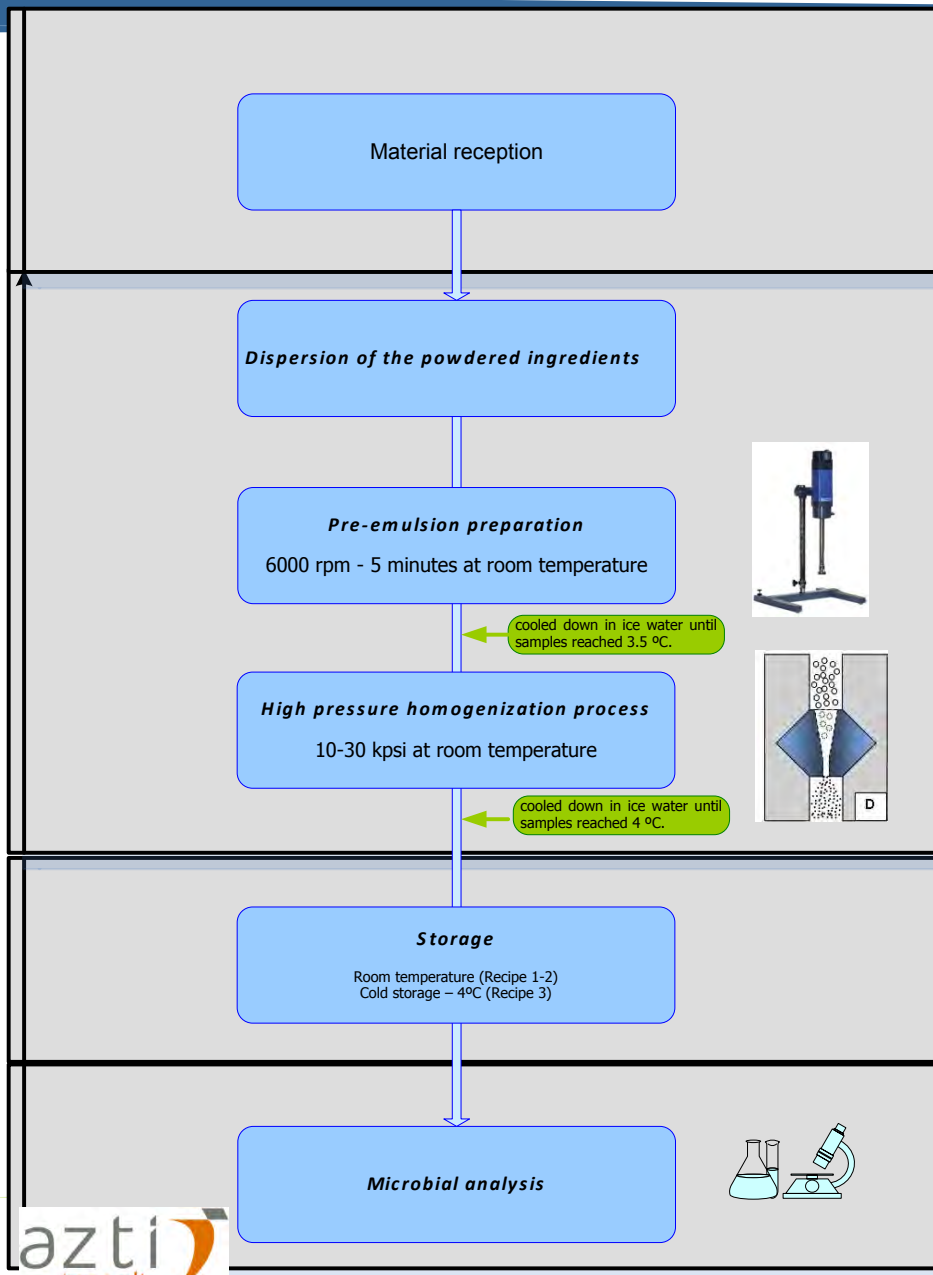
FINAL PLEASURE Conference

Sugar-, salt- and fat-reduced ready-to-eat fruit and vegetable components

*B. Perez-Villareal, T. Loetzbeier
December 5th 2014*



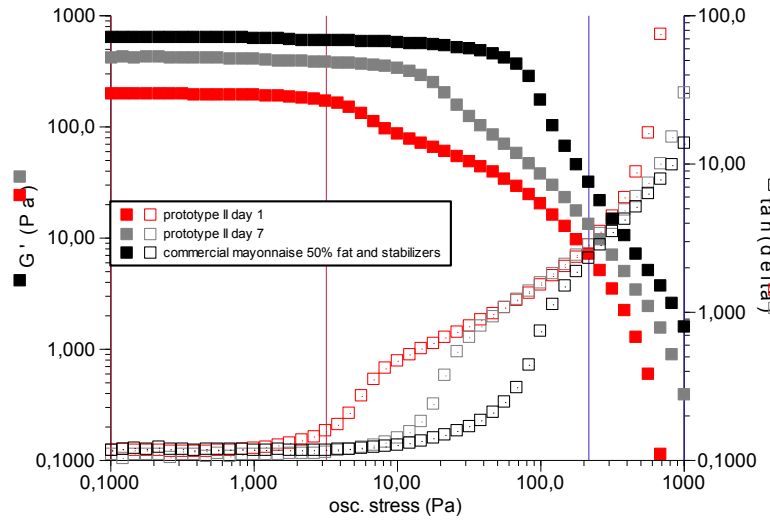
Development of salt and saturated and trans fat reduced sauces by physical processes



Homogenized samples were then processed with a Micro DeBEE device (Bee International, USA)

Mayonnaise sauce (Fat & Salt reduction)

prototype II - comparison with commercials and prototype I

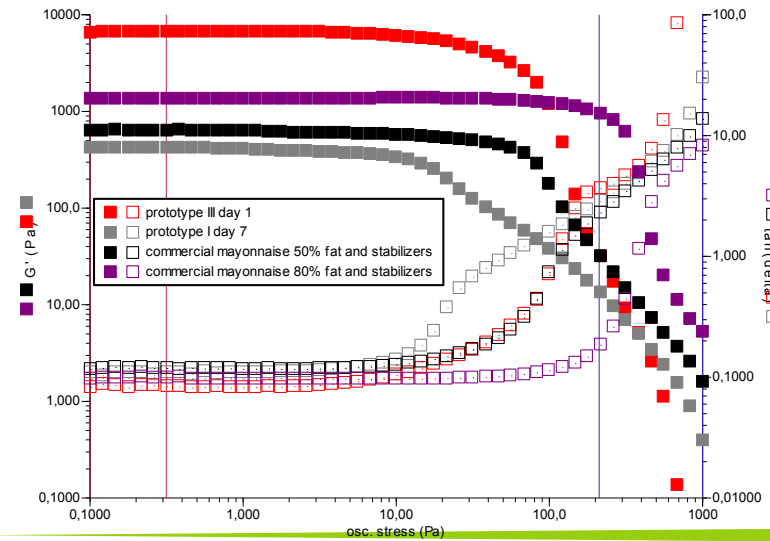


35% fat reduction/50% salt reduction/high pressure

- Fat-reduced sauce showed similar textures than commercial one (with thickeners)
- Good stability throughout storage
- Acceptable sensory properties



prototype III - storage stability

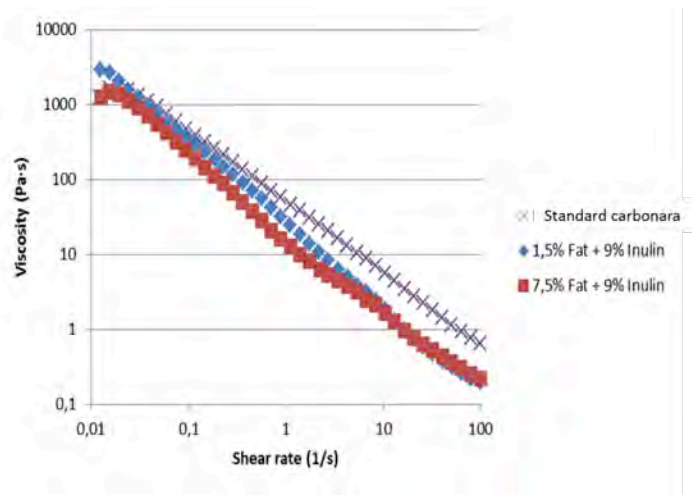


98% fat reduction/50% salt reduction/inulin addition/ high pressure

- Fat-reduced sauce showed thicker texture than commercial ones (even the 80%fat mayonnaise)
- Good stability throughout storage
- Acceptable sensory properties



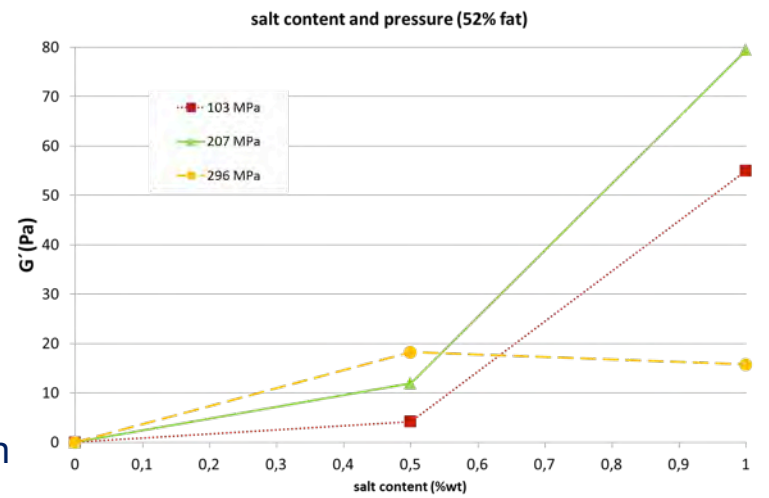
Carbonara sauce (Fat & Salt reduction)



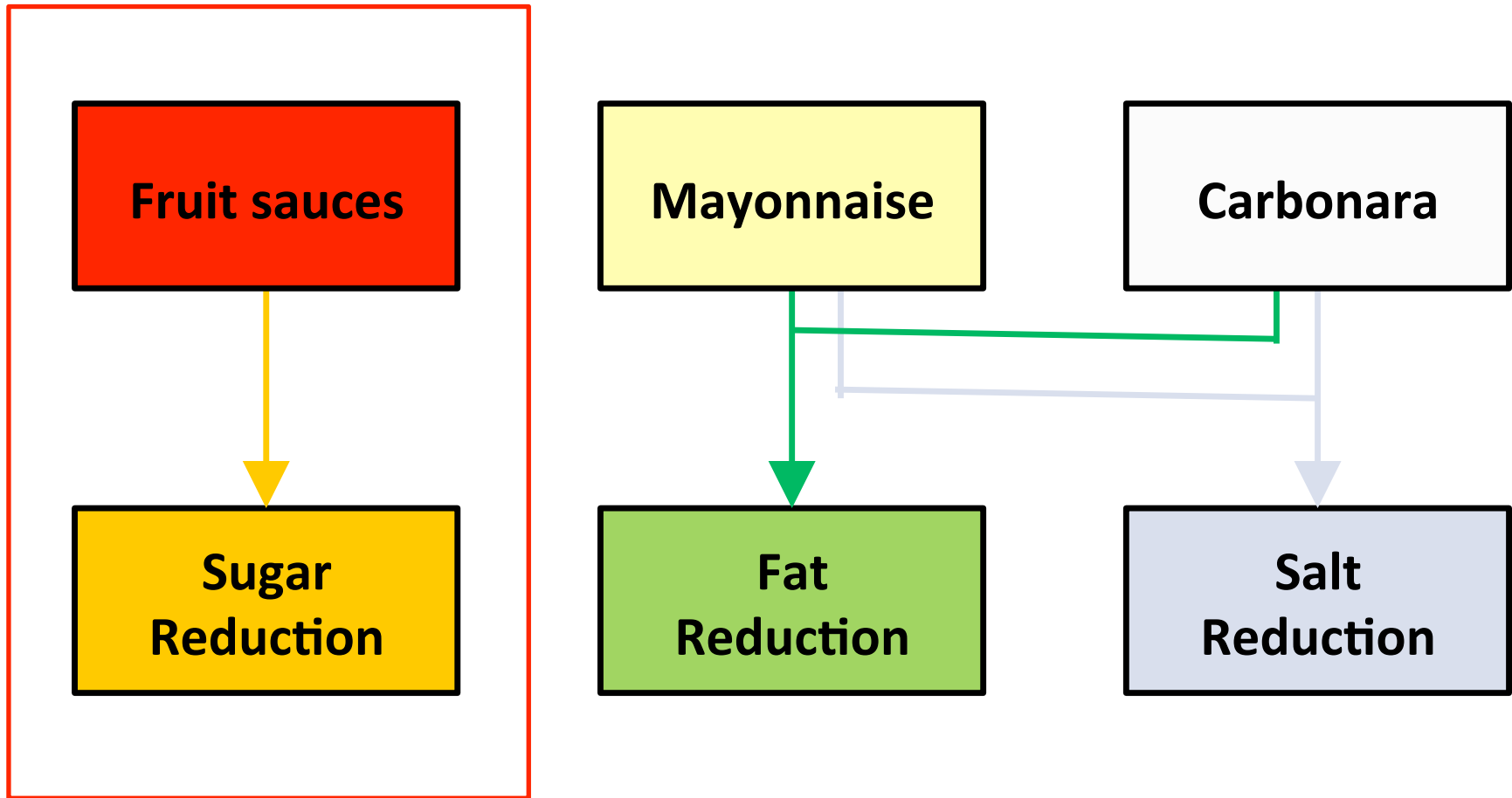
- Adding 6% of inulin to treated RF-emulsions increase yield stress which is related to the initial viscosity of the sample
- Lower oil contents (7,5% and 1.5% oil) produced really interesting textures which may be valid for other applications, such as pizza toppings that show a softer texture
- Cream-like sauce system with fat content of 7.5% and 1.5% mixed with a 9% inulin concentration gave the same viscosity values than the standard carbonara

Salt Effect

- The addition of NaCl shows higher stability, higher viscosity and a firmer emulsion
- The application of higher homogenization increased the firmness of the sauce
- Depending of the pressure level, firmness can change
- It is possible to play with the ratio salt content:pressure level to get optimum textures
- High pressure homogenization increased final salt perception



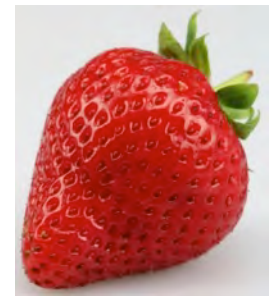
- HPH technology is able to produce low-fat and low-salt sauces with similar texture than full-fat commercial sauces
- In mayonnaises, the critical fat content to maintain texture is around 52% fat (35% fat reduction) without adding any thickeners at all
- Emulsion stability throughout a storage time of 3 months is optimal
- Adding 10% of inulin to treated 98% reduced-fat emulsions produced higher viscosity values to the commercial sauce
- In carbonara sauce: 7.5% fat (54% fat reduction) and 1.5% fat (90,8 % fat reduction) samples were produced
- A salt reduction of 50% shows same texture and salt perception than the traditional sauces
- By combining pressure treatment, inulin concentration and salt concentration, it is possible to produce a full range of sauces with different properties
- These results clearly conclude that it is possible to obtain sauces with a fat reduction up to 98% and open a new window to the production of healthy sauces without missing the original sensory properties.



Fruits are an excellent source of healthy ingredients...

...but unfortunately too high in sugar

Product	Total sugar content
Apple	10.0 %
Cherry	9.9 %
Peach	8.0 %
Strawberry	5.4 %



Potential consequences: increased risk of obesity or caries (children)

Potential possibilities for labelling:



REDUCED IN SUGAR

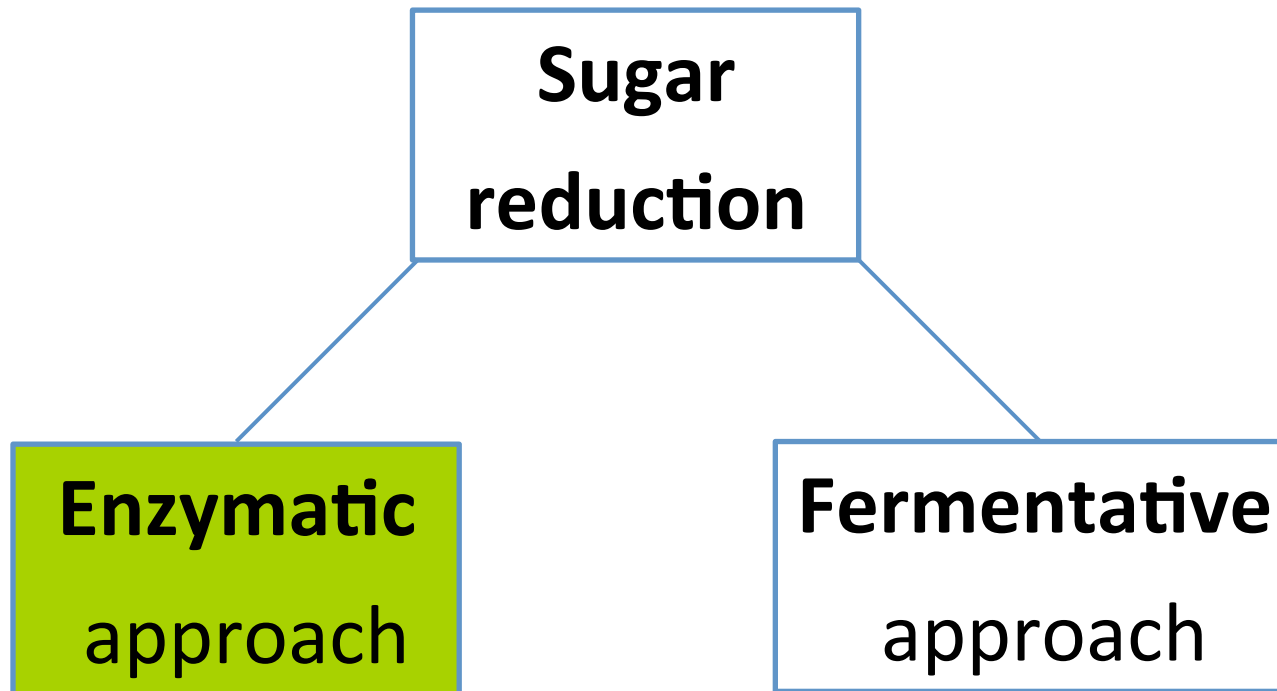
ENERGY-REDUCED

LITE

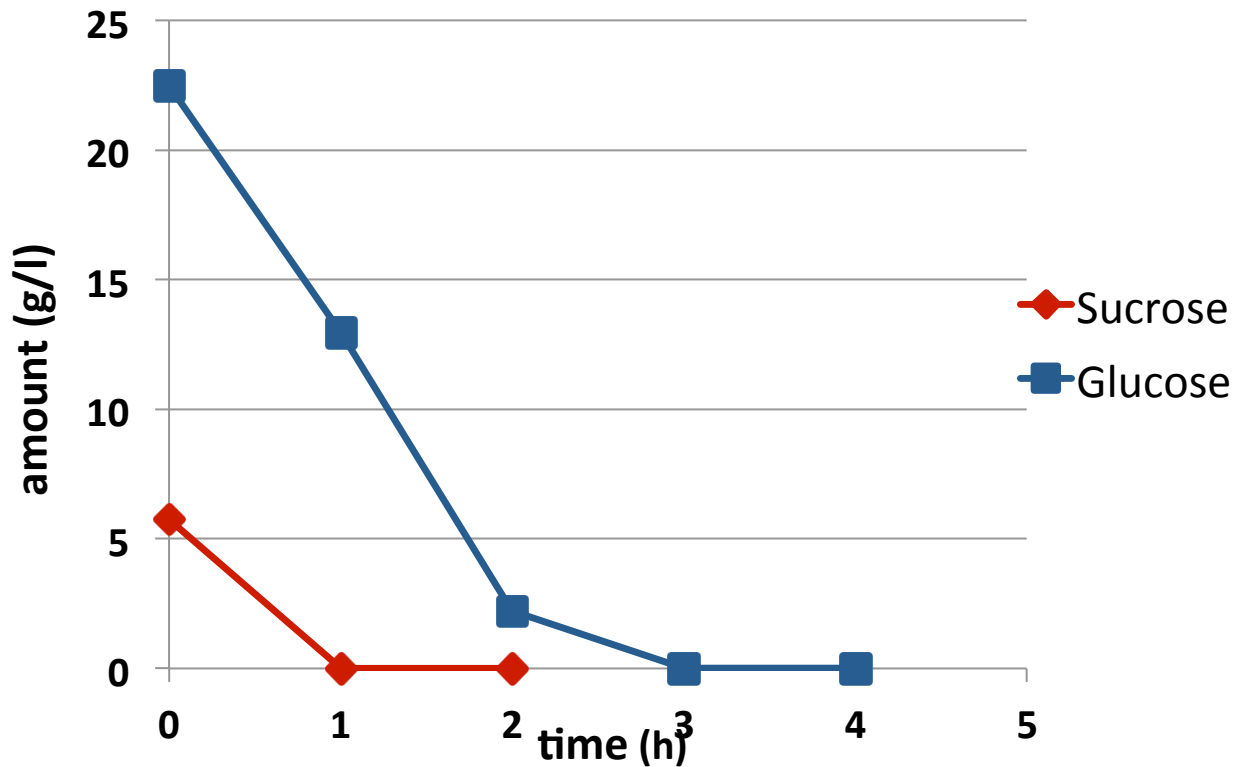


Minimum criteria: almost 30 % sugar reduction

EC Regulation No 1924/2006



Enzymatic sugar reduction in strawberry puree:

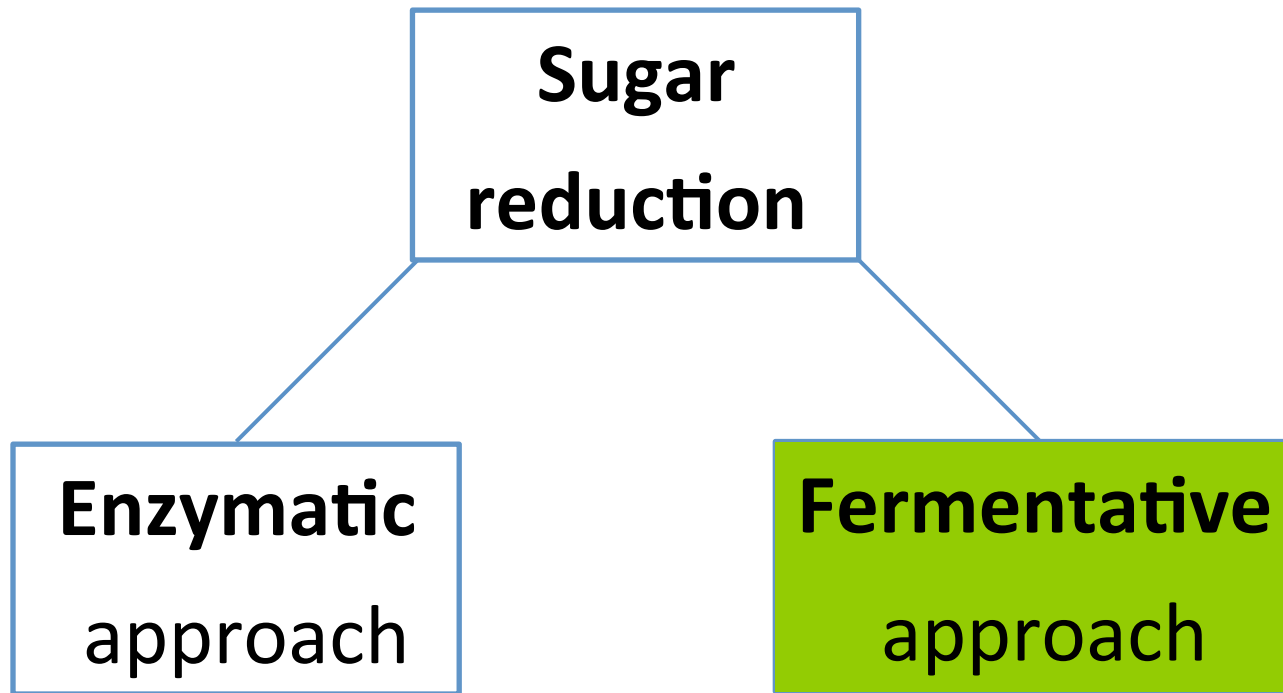


**45 %
reduction
of total
sugar**

Summary

- for fruit and vegetable purees: almost 30% sugar reduction reached
- No significant change in fruit ingredients
- process applicable for juice and purees
- easy to implement in existing industrial processes
- process patent pending

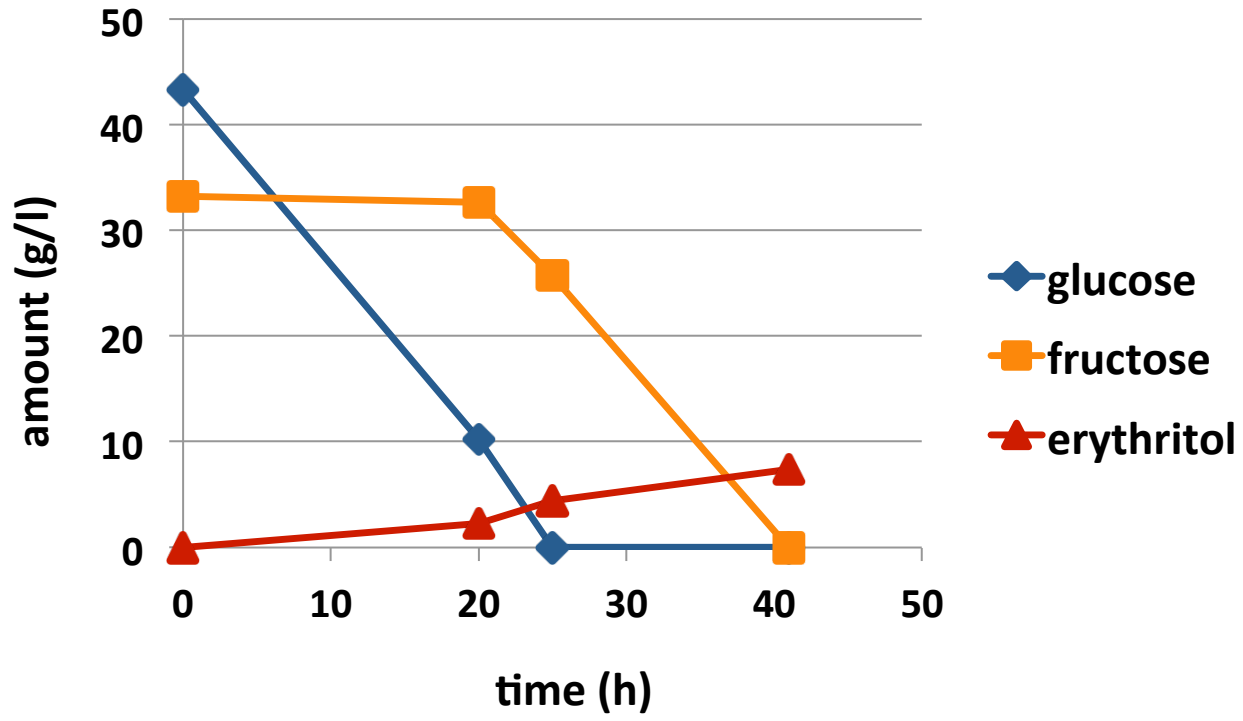


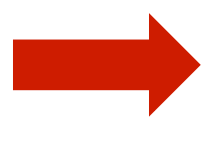


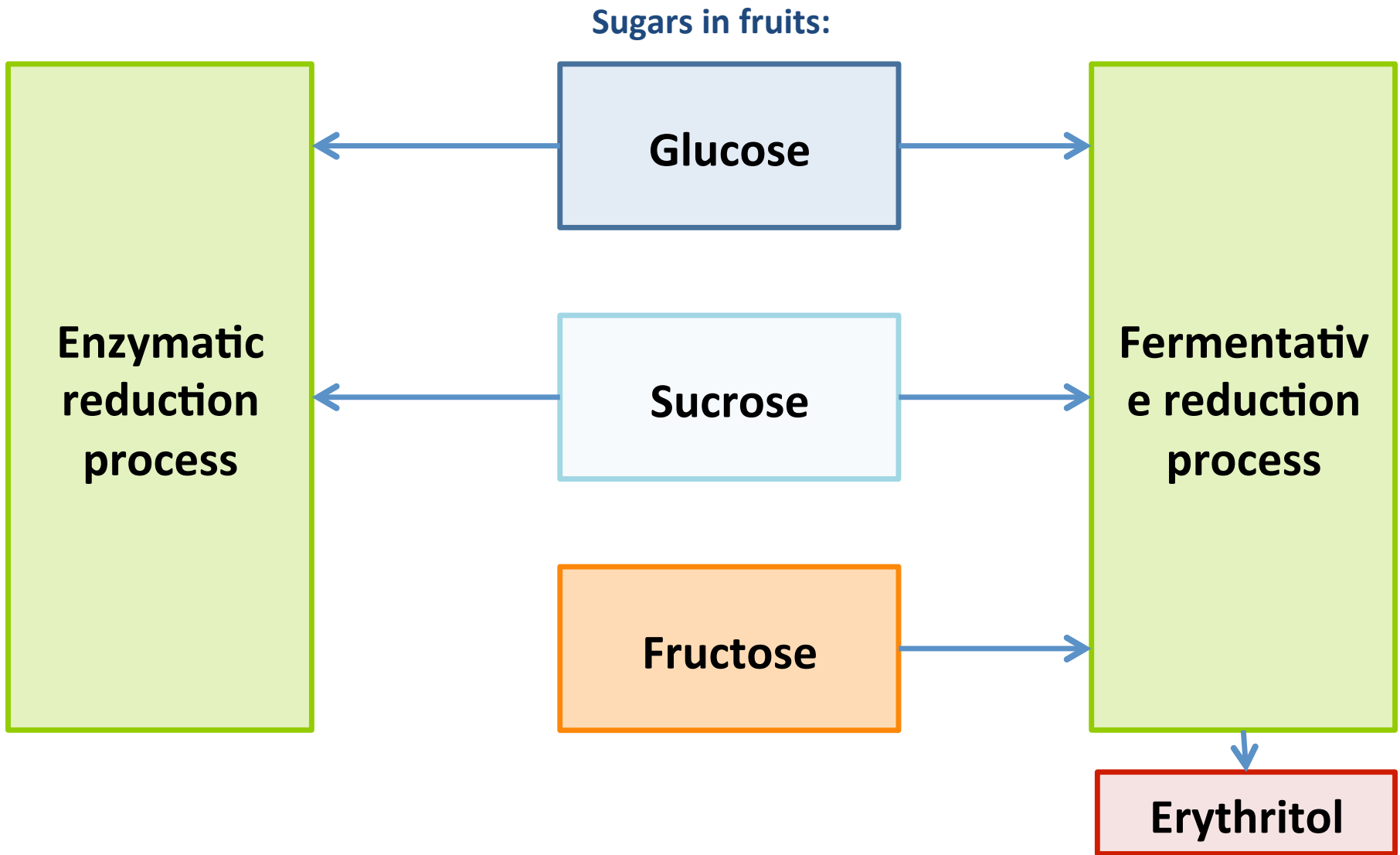
Objective: remove high caloric sugar and keep sweetness



Fermentation of cherry puree with selected strain




 Production of erythritol ✓
 Adaption to different fruit substrates ✓



New biotechnological sugar reduction processes:

- Platform technology for sugar reduction in juices & sauces
- Label „sugar reduced“ in 100% fruit products reached
- Processes patent pending



Fat & Salt reduction processes:

- High pressure homogenization process successful developed for fat & salt reduction in sauces
- Up to 52 % fat reduction in mayonnaise reached
- With a salt reduction of 50 % no change in taste or texture

Thank you for your attention