

Introduction

Yogurt is a functional food mainly known by its prebiotic and probiotic properties. On the other hand, the addition of fruit rich jams or honey to yogurts has been widely used to improve the organoleptic and nutritional value of this food product. These components also allow obtaining a different range of products that can gain the consumer preference.

Fruits and honey are themselves functional products rich in nutraceutical components such as vitamins or flavonoids. The **antioxidant activity** of different foods has been associated with the presence of such nutraceutical compounds therefore their presence in yogurt formulations should have a similar impact in their antioxidant power.

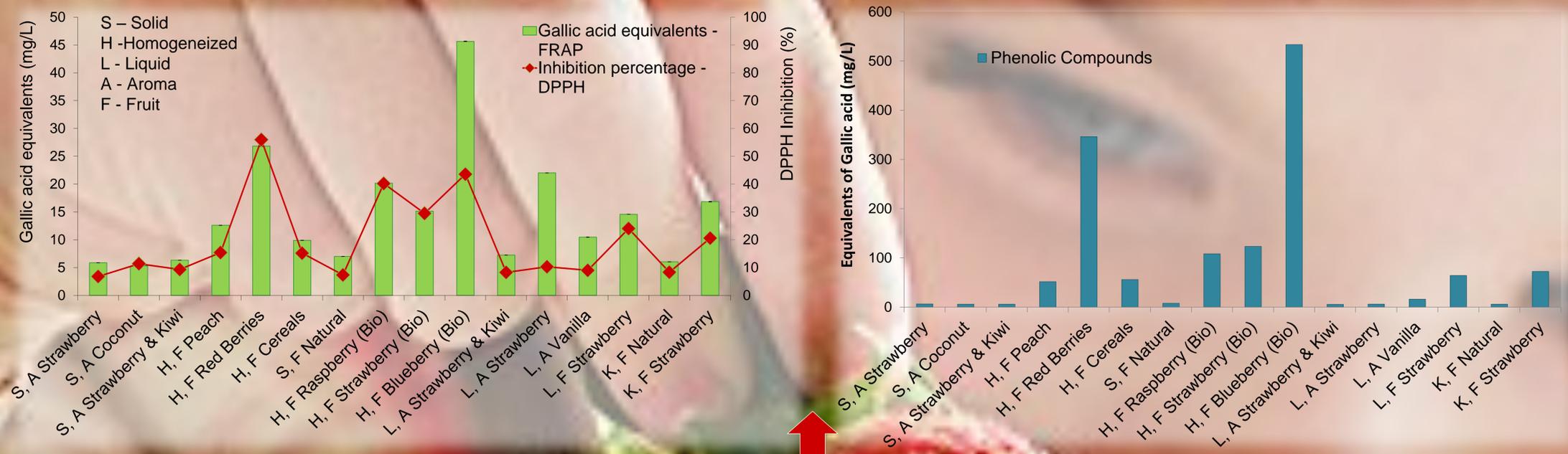
Methods

Commercial yogurt samples were obtained in local markets, stored in sterile containers and immediately frozen to -20C. Natural yogurt, without sugar addition was supplemented with honey in a concentration producing the same content in reducing sugar as the yogurts with sugar addition. The extraction of antioxidants from yogurt samples was performed using solvent extraction at room temperature, with 100% ethanol, 75% ethanol, 100% acetone, 75% acetone and 50% acetone-50% ethanol mixture. The antioxidant activity of the different yogurt samples and of their extracts was determined using the following tests: DPPH radical scavenging activity, ferric reduction antioxidant power (FRAP) Folin-Ciocalteu reaction. The samples were also used in consumer acceptance tests in order to evaluate its organoleptic quality (30 volunteers with ages between 25 e 45 years).

Objectives

The purpose of this work is to evaluate the effect of yogurt components, namely fruits and honey, in its antioxidant activity. The antioxidant activity will be evaluated in the total yogurt or in selected extracts.

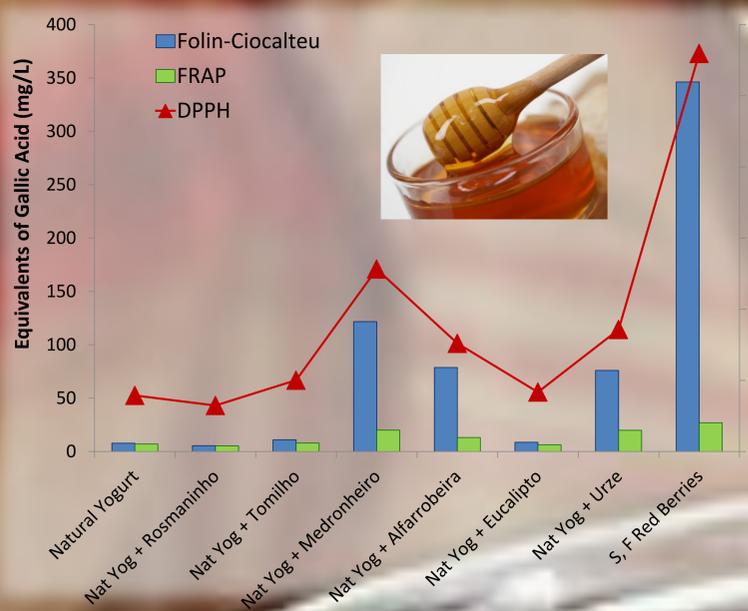
The methods developed will be applied to a range of commercial yogurts (natural, aroma, cereal, fruit and honey yogurts) and natural yogurts supplemented with Portuguese honey from different botanical origins.



✓ **Blueberry biological yogurt** showed the highest antioxidant activity in FRAP and Folin-Ciocalteu tests.

✓ **A low price, red berries homogenized yogurt** showed an antioxidant activity higher than all other yogurts except the blueberry biological yogurt.

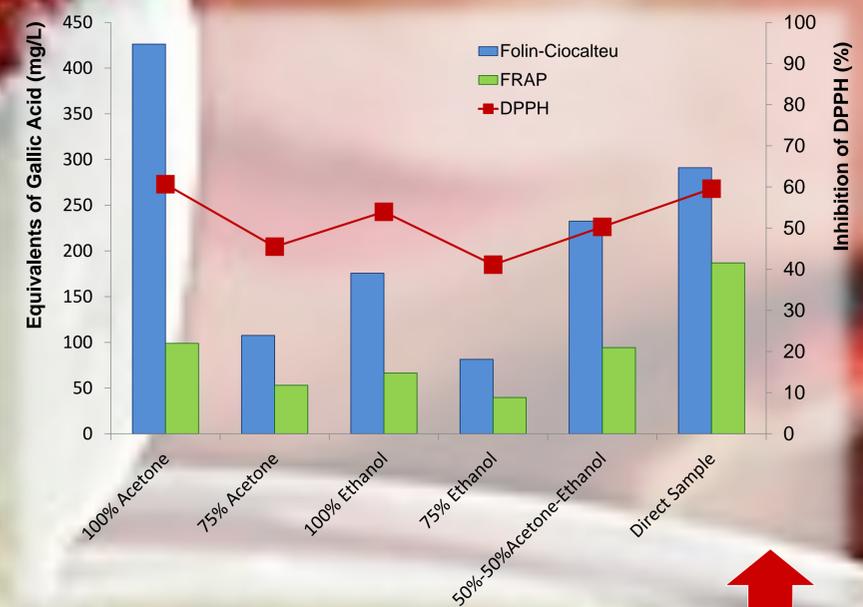
✓ **Solid aroma yogurts** showed **lower antioxidant activity** than homogenized or liquid yogurts with fruit pulp.



❖ **Honey** increases the **antioxidant activity** of natural yogurt.

❖ **Darker honeys** like *Arbutus unedo*, *Locust podshrub* or *Ericaceas* produces a clear increase in the antioxidant activity of natural yogurt .

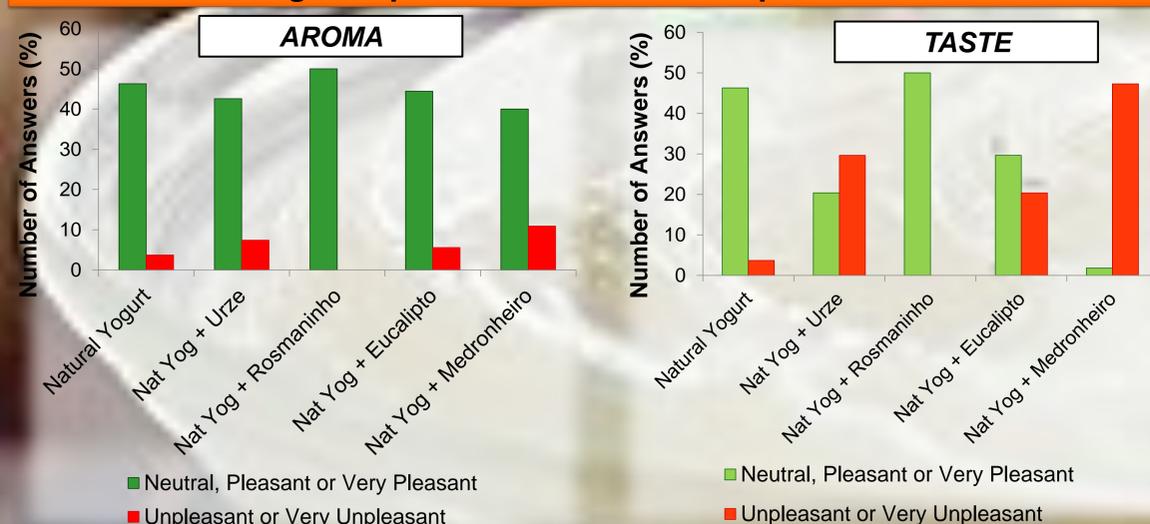
❖ **Light honeys** like rosemary or orange do not influence the antioxidant activity but can still be used as alternative sweeteners



✓ **100% acetone** extract presented higher activity in all tests when compared with other solvents

✓ **Direct analysis** of the yogurt samples gave **higher values** for the reduction activity (**FRAP**) than **all extracts**.

Organoleptic and Consumer Acceptance Tests



❑ The use of **honey** as a yogurt component didn't affect the consumer perception of **aroma** when compared with natural yogurt with sugar.

❑ **Locust podshrub** honey has a bitter taste that was perceived as **unpleasant** in the association with yogurt.

❑ **Rosemary** honey is considered to improve the **taste** of yogurt.

Conclusions

Honey with moderate color like thym or eucalyptus may improve the antioxidant properties of yogurt without having a negative effect in the taste perception by the consumers.