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Glycaemic and potential prebiotic impact of potato carbohydrates: Influence of processing and cultivar
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Background – Potatoes have become regarded as a staple of doubtful nutritional quality because they often have a high glycaemic index and a low content of dietary fibre. However, as potatoes are starchy, their nutritional impact can be greatly affected by conditions that influence the digestibility of starch in them. One such condition is cold treatment after cooking, which reduces the rate of starch digestion in potatoes by inducing conversion of rapidly digested starch (RDS) to slowly digestible starch (SDS) and digestion-resistant starch (RS).

Objective – To determine the effect of cold treatment after cooking on the glycaemic impact of potatoes, measured as the release of sugars during starch digestion in vitro under simulated physiological conditions. To measure cultivar differences and processing effects on formation of SDS and RS with cold treatment after cooking.

Design – Supermarket potatoes were screened to determine the tendency of different cultivars to form slowly digestible starch after cooking and cooling. A cultivar showing a relatively strong tendency to form SDS was then used to systematically investigate the influence of cooking, cooling, milling, coarse mincing, pasting, freezing, freeze-drying in over 20 combinations.

Outcomes – Potatoes digested immediately after cooking were predominantly RDS. Cooling the cooked potatoes for 2 days at 4 ºC caused a marked reduction in RDS and increased SDS and RS, with large intercultivar differences. The formation of SDS and RS was markedly influenced by processing conditions and the relative proportions of SDS and RS formed depended on the conditions chosen.

Conclusions – Cold treatment of potatoes after cooking can be used to enhance them nutritionally by lowering their glycaemic impact and increasing their dietary fibre content. As the reduced glycaemic impact results largely from a reduced rate of available carbohydrate digestion, the glycaemic index of the potato carbohydrate is reduced. However, despite having a moderate or high glycaemic index, the glycaemic impact of freshly cooked potatoes is only moderate because they contain a low density of available carbohydrate.

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Does heat degrade the concentration of phenolic compounds in extra virgin olive oil thereby negating their healthful properties?
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Background – The phenolic fraction of extra virgin olive oil has generated much interest regarding its possible health promoting properties. Studies (human, animal, in vivo and in vitro) have revealed that olive oil phenolics have positive effects on certain bio-markers of health, such as: plasma lipoproteins, oxidative damage, inflammation, platelet and cellular function and antimicrobial activity. However, a number of factors have the ability to alter the concentration of key health benefiting phenolic compounds in extra virgin olive oil. For instance, heat application during cooking has been shown in a limited number of studies to alter the concentration of particular olive oil phenolics. This is of significance as extra virgin olive oil is often used as an ingredient in a number of cooked meals. Therefore, it is of great importance to understand this factor in greater detail in order to preserve the essential health promoting benefits of olive oil phenolic compounds.

Objective – To determine if heating degrades key phenolic compounds (hydroxytyrosol, deacetoxy oleuropein, oleuropein aglycon, ligstroside aglycon and oleocanthal) in extra virgin olive oil.

Design – One extra virgin olive oil containing a significant level of olive oil phenolics (>200 ppm) was heated to 100°C, 170°C & 240°C for 1, 5, 20 and 60 minutes, using a full-factorial design. Olive oil phenolics were isolated, identified and quantified by high performance liquid chromatography-mass spectrometry (HPLC-MS).

Outcomes – There was differential and significant (P<0.05) degradation among the key health benefiting olive oil phenolic compounds during cooking. The extent of degradation was dependent upon the temperature applied and the time period of heat application.

Conclusions – Olive oil phenolics are heat labile, but to varying degrees. Therefore, the health promoting benefits of phenolic compounds in olive oil are maximized when the application of heat is minimised.