

Video « Analysis of dietary fat »

Time	Text
00 :09	Welcome. In this part, we are presenting a note about the analysis of dietary fat. The aim is to help you to select the right fat according to the application you want to perform, but also to give you some knowledge about the quality of dietary lipids.
00 :22	But first, I will remind you some properties of dietary lipids: <ul style="list-style-type: none"> - They are defined by a common property: they are not soluble in water but are partially or totally soluble in organic solvents. Therefore, there are a lot of different molecules in dietary lipids. - There are mainly fatty acids: either free fatty acids, but most of the time, esterified fatty acids, e.g. triacylglycerols or phospholipids. - In the dietary lipids, there are also a lot of micro-constituents, like sterols (phytosterols in vegetal oils or cholesterol in butter), tocopherols (as alpha-tocopherol which gets interesting vitamin E activity), liposoluble pigments (carotenoids), but also all phenolic compounds that can be found in some dietary oils like olive oil (tyrosol or hydroxytyrosol)
1 :10	All these dietary lipids get a lot of different functions in food.
1 :15	First of all, they get nutritional functions. Indeed, they take part into the energy supply provided by the food, they are a source of fatty acids, in particular essential fatty acids as linoleic acid (omega 6 precursor) or alpha-linolenic acid (omega 3 precursor). Moreover, they bring and drive liposoluble vitamins and other essential constituents as sterols.
1 :39	Lipids also take part to the organoleptic quality of the food. They are indeed responsible for the creamy texture as well as the shiny aspect of food. Finally, they add a specific flavour.
1 :54	Last but not least, dietary lipids get technologic functions. They are used as heat transfer for different cooking operations as the frying. They also can be used as coating agents and they are able to bring some aromas or liposoluble compounds.
2 :10	These different functions are directly linked to the chemical structure of these compounds, like the length of their carbon chain or their number of unsaturations. But they are also linked to their physico-chemical properties, like the melting point, and to their chemical reactivity which will be important during the production of food products, their use or their consumption.
2 :39	Why would you need to analyse dietary fats? First, in order to know the composition, that means to know the quantity of each compound previously mentioned, e.g. fatty acids' profile or content of vitamin E. These kind of information will help you to know the properties of the fat and so, to identify the possible applications.
3 :04	Moreover, these analyses could help you to assess the fat quality. Indeed, during the production and storage of food products, dietary fats are subjected to some reactions. For example, triacylglycerols or phospholipids can be hydrolysed. Therefore, free fatty acids are released, which leads to a lower lipid quality.
3 :25	Also, unsaturated fatty acids can be subjected to isomerisation reactions, which will form <i>trans</i> fatty acids.
3 :33	Finally, oxidation reactions could occur. These complex reactions will produce a lot of different compounds. Among them, some volatile molecules (as aldehydes, ketones or acids) will be responsible for the rancidity of food products.
3 :50	So, in this note, you will find different analysis methods of dietary fats. For each method, we will remind you the theory, we will present you the procedure that you can perform during your laboratory project and finally, we will give you some information to help you to understand your results and to identify the interesting fats for your project.