***Food Chemistry Web Quest***

Your Mother was a Chemist <http://kitchenscience.sci-toys.com/Introduction>

**Fats and oils**

**Web sites to help you:**

[**http://kitchenscience.sci-toys.com/fats**](http://kitchenscience.sci-toys.com/fats)

[**http://kitchenscience.sci-toys.com/protein**](http://kitchenscience.sci-toys.com/protein)

[**http://kitchenscience.sci-toys.com/oxidation**](http://kitchenscience.sci-toys.com/oxidation)

[**http://kitchenscience.sci-toys.com/heating**](http://kitchenscience.sci-toys.com/heating)

1.   Olive oil is mainly mono-unsaturated, whereas sunflower oil is mainly poly-unsaturated. Explain what is meant by these terms. How would you expect the melting points of these two oils to compare? Explain why this is so.

 2.   Most naturally occurring unsaturated oils are the cis-isomer, but hydrogenation of poly-unsaturated oils can give the trans-isomer of unsaturated oils.  Explain how cis- and trans- isomers differ and state what differences you would expect between these isomers firstly with regard to melting point and secondly with regard to nutritional value.

3. You are planning to make a ‘strawberry candy’ with a texture similar to chocolate by blending together a lipid base, sucrose, food coloring and artificial strawberry essence. What kind of lipid would you choose for this? Justify your choice.

 4.   Going from lard, through olive oil to canola oil to corn oil the degree of unsaturation increases. How would you expect the chemical stability of these lipids to vary? Explain this.

5. Vegetable oils are frequently hydrogenated.  Give the reagents and conditions used for these reactions. Give two advantages for the food industry of doing this and two health concerns that the general public might have about the products.

**Genetically Modified foods**

**Web sites to help you**

[**http://www.csa.com/discoveryguides/gmfood/overview.php**](http://www.csa.com/discoveryguides/gmfood/overview.php)

[**http://www.albrightseed.com/biologicalengineering.htm**](http://www.albrightseed.com/biologicalengineering.htm)

1.   Briefly describe the process by which a plant or animal can be modified to produce a genetically modified (GM) food.

2.  Give three separate ways in which genetic modification might improve the yield from a food crop.

 3.   As well as improving the viability of plants and animals, genetic modification can also result in novel substances being produced by organisms.  Give a specific example of such a modification.

 4.   Many people are opposed to the introduction of genetically modified plants and animals. Explain what their major concerns are.