

FACTFILE: GCE NUTRITION & FOOD SCIENCE

ALCOHOL



Alcohol

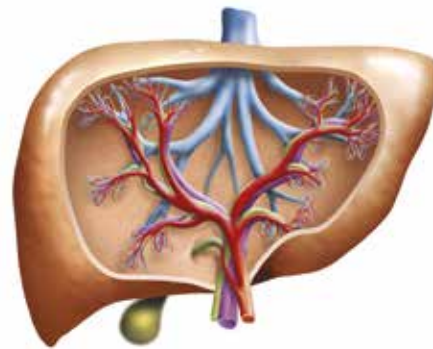
Learning outcome

- Explain the nutritional consequences for adult men and women of excessive alcohol consumption.

Course content

There are many nutritional consequences for both adult men and women arising from excessive alcohol consumption. Excessive alcohol can result in a reduced appetite which can have nutritional consequences because of the lack of foods eaten. The main nutritional consequences can be summarised as:

1. Fat metabolism
2. Impact on blood glucose levels
3. Bioavailability of vitamins
4. Interference with iron and zinc.



Fat metabolism

Fat metabolism by the liver becomes abnormal if excessive alcohol is consumed. Alcohol promotes the accumulation of fat in the liver because it substitutes ethanol for fatty acids. Alcohol consumption increases hyperlipidaemia and when alcohol consumption is subsequently reduced or stopped, lipid levels in the liver return to normal. Alcohol also increases LDL cholesterol in the liver which may have an impact on cardiovascular disease (CVD).

Alcohol passes from the stomach and intestines into the blood and goes to the liver. In the liver enzymes convert alcohol to acetate. Alcohol reduces the amount of fat the body burns for energy. As the body cannot store acetate, the body system wants to get rid of it as quickly as possible, and this process takes priority over absorbing nutrients and burning fat.

Impact on blood glucose levels

The body reacts to alcohol as a toxin and channels all energy into expelling it. This means that other processes are interrupted, including the production of glucose and the hormones needed to regulate it. Excessive alcohol causes the pancreas to be inflamed,

affecting the production of insulin release, which has a subsequent impact on blood sugar. Excessive alcohol consumption causes an increase in insulin secretion which leads to low blood sugar (hypoglycaemia).

[Check the facts](#)



Bioavailability of vitamins

Water soluble vitamins

Excessive alcohol intake affects an individual's nutrient status, as it reduces food intake as well as interfering with the digestion, absorption, metabolism and utilisation of some nutrients. Due to alcohol being a diuretic, water soluble vitamins are excreted in the urine. Alcohol can impair nutrient absorption by damaging the cells lining the stomach and intestines, and disabling the transport of vitamins into the blood. In addition nutritional deficiencies themselves may lead to further absorption problems. Alcohol inhibits the absorption of the B-complex vitamins and alcoholics are usually deficient in B-complex vitamins. There may also be nutritional deficiencies in niacin, riboflavin and pyridoxine, resulting in oral problems in the mouth or pellagra resulting in diarrhoea, dermatitis and dementia. Alcohol blocks the absorption of folate/ folic acid. Folate assists the development of an embryo's spinal cord, helping to build DNA. Excessive alcohol in pregnant women can be detrimental to a baby's development because alcohol prevents folate entering the blood and body tissues.

Fat soluble vitamins

The absorption of all fat soluble vitamins may be affected because the production of bile from the liver is reduced. Heavy alcohol consumption can lead to a deficiency of vitamin D because alcohol interferes with how the body absorbs and activates the vitamin. Alcohol can also break down vitamin D so that it is unavailable in the body and this can lead to the malabsorption of calcium.

Excessive alcohol consumption is linked to a deficiency of vitamin K because the body usually has small stores of vitamin K and the reduction in bile affects its production. As vitamin K is necessary for blood clotting, deficiencies can cause delayed clotting and can result in excess bleeding.

Effect of alcohol on iron and zinc status

Excessive alcohol may cause the body to store additional iron or it can reduce iron status depending on the type of alcohol consumed. Spirits contain no iron while beer and wine do contain iron. Iron toxicity caused by drinking too much alcohol can lead to damage of internal organs especially the liver. Excess iron is usually stored in the organs and tissues and in a number of cases iron-induced toxicity has occurred in heavy drinkers. Low iron status can be a result of internal bleeding which can arise from blood loss due to irritation in the intestines. Frequently iron can be low due to poor eating habits in alcoholics.

Alcohol can cause a zinc deficiency by decreasing how well zinc is absorbed, but also by inhibiting the absorption of other nutrients that zinc depends on for its function. Zinc is important because it forms an essential part of the enzyme system which breaks down alcohol in the body. If zinc intake is low, this affects alcohol metabolism, wound healing and the immune function.

Any association that exists between moderate alcohol consumption and the absorption and metabolism of nutrients from the diet is dependent on a number of factors, including:

- the nutrient in question
- intake of the nutrient
- nutritional status of the individual
- the quantity of alcohol consumed over a period of time.

? Revision Questions

1 Describe how excessive alcohol causes megaloblastic anaemia?

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2 Alcohol can cause a zinc deficiency by inhibiting the absorption of other nutrients that zinc depends on. What other nutrients work with zinc?

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3 Summarise the possible consequences of consuming excessive amounts of alcohol in adulthood.

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? Revision Questions

4 Describe how vitamin status can be impaired by excessive alcohol consumption.

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5 Compare the difference between the status of water soluble and fat soluble vitamins in adults who consume a lot of alcohol.

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6 Explain how blood clotting is affected by excessive alcohol consumption?

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