Committee on CARCINOGENICITY

Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment (COC)

COC Statement 2018/S01 – Non-Technical Summary

Non-Technical Summary of Statement on possible carcinogenic hazard to consumers from insulin-like growth factor-1 (IGF-1) in the diet

Non-technical summary

Insulin-like Growth Factor (IGF)-1 is a hormone involved in the normal growth and development of body tissues. IGF-1 is largely produced in the liver. The structure of IGF-1 is identical in humans, cattle and pigs so that any IGF-1 that originated in other species would also become active in humans.

It has been suggested that IGF-1 may be involved in the development of cancer. This is because it is known to cause cells to proliferate (divide) as part of its normal function and may also inhibit apoptosis (programmed cell death of damaged cells). It is also known that individuals with acromegaly (a condition of excess growth) have elevated levels of growth hormone and IGF-1 and an increased risk of colorectal cancer.

IGF-1 concentrations in the blood vary depending on factors such as age, gender and diet. IGF-1 is also present in animal tissues and is likely to occur in foods from animal sources such as meat and milk, although few data are available for foods other than milk.

IGF-1 is found in cows' milk. The IGF-1 levels present in milk depend on the breed of cow and are highest immediately after calving. The levels then decline rapidly once the cow has been milked several times. Cows treated with the hormone bovine somatotropin (BST) produce higher concentrations of IGF-1 in their milk, so concerns have been expressed that this could increase the risk of cancer in consumers who drank the milk.

IGF-1 is likely to be digested by gastric enzymes and very little is thought to be absorbed intact. This means that IGF-1 present in food would not be expected to be active within the body in the way that IGF-1 produced by the body itself would be.

COC review

The COC reviewed an extensive database of studies that assessed circulating IGF-1 levels and risk of breast, prostate, colorectal and lung cancer. The Committee also assessed the effect of diet (including milk consumption) on IGF-1 concentrations in the blood, and considered the studies which examined possible links between diet, IGF-1 concentrations and cancer risk. A variety of background information on IGF-1 was also considered.

An estimate was made of the possible exposure to IGF-1 from the diet. It was calculated that, even in consumers of the highest possible amounts of IGF-1, the amount of IGF-1 consumed would still be significantly lower (less than 2%) than the IGF-1 produced by the body itself.

COC Conclusions

Increased circulating levels of IGF-1 are associated with an increased risk of certain cancers. However, many factors influence IGF-1 concentration in the blood and since tumours are also able to produce their own growth factors, the explanation for this association is unclear.

The COC concluded it was unlikely that there would be absorption of intact IGF-1 from foodstuffs by most consumers.

Very few of the available studies in humans have linked cancer risk, diet and circulating IGF-1 concentrations. Where it has been investigated, there is no evidence of any association between milk or dairy consumption and cancer risk. If anything, milk consumption appeared to reduce risk.

The COC noted that there were a number of limitations to the available studies; these included a lack of information on diet, ethnicity of the study subjects and changes in blood IGF-1 concentrations over time, with the majority of studies measuring it only at the start of the study.

Overall, the Committee concluded that on the basis of the available evidence, IGF-1 from foodstuffs in the diet is not expected to increase the risk of cancer in consumers.

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