

**COMMITTEE ON TOXICITY OF
CHEMICALS IN FOOD, CONSUMER
PRODUCTS AND THE ENVIRONMENT**



**STATEMENT ON
NITRATE METABOLISM
IN MAN**

Introduction

1. The European Commission (EC) has introduced a Regulation (EC Regulation No. 194/97) which sets maximum levels for nitrate in lettuce and spinach. This Regulation has been introduced to harmonise limits for nitrate in these vegetables and in response to the EC's Scientific Committee on Food's (SCF) consideration of the toxicity of nitrate. The UK and several other Member States are currently operating an optional derogation from the maximum levels for domestic produce.

2. Recently, the Committee considered a report of a study entitled 'Metabolism of dietary nitrate in the gastrointestinal tract in man', carried out by G. McKnight, L. Smith, M.N.H. Golden and N. Benjamin, which had been commissioned by the Ministry of Agriculture, Fisheries and Food (MAFF). The Committee was asked to give its view as to whether this study had implications for the determination of the Acceptable Daily Intake (ADI) for nitrate. The report and the Committee's views have been passed to the EC and the SCF.

The Study

3. The study investigated the relationship between ingested dietary nitrate in various forms and the production of nitric oxide in the stomach and whether the formation of nitric oxide might be an important mechanism in maintaining host defences against ingested pathogens, in the modification of platelet aggregation in the blood and in other aspects of physiology. An important objective of the study was to determine whether nitrate in an organic matrix ingested as part of a meal was metabolised differently from nitrate in a salt form as used in toxicological studies.

Conclusions

4. The Committee considered that the studies with nitrate salts, coupled with the work on isotopically-labelled lettuce, were relevant contributions to the study of nitrate metabolism and accepted that the administration of dietary nitrate gave rise to the generation of nitric oxide. Additionally, it noted a need to distinguish the source of the nitrate (i.e. whether from lettuce or salt) in any comments on nitric oxide generation.

5. As regards the role of nitric oxide in respect of the host animal's defence against ingested pathogens, the Committee regarded the proposal as speculative and not supported by the data. It also expressed its reservations about the proposed role of nitric oxide in the modification of platelet aggregation, a complex process which is not a specific measure for the systemic activity of nitrate. The Committee considered that further studies were needed in order to fully assess the risk and benefit of dietary nitrate.

6. Although the Committee considered that the study by Professor Benjamin would not influence the ADI for nitrates and nitrites it agreed that the study report, with a statement of its views, should be submitted to the European Commission's Scientific Committee on Food to inform its deliberations.

January 1999

(COT Statement 1999/01)