

INTRODUCTION

Red meat forms part of the habitual balanced diet for many people around the world. Several, but not all, recent epidemiological and experimental studies suggest that a high intake of meat, especially red and processed meat, is associated with increased colorectal cancer (CRC) risk, the third most common cancer and the fourth cancer cause of death globally. Some agencies are investigating the matter due to its importance in public health.

HYPOTHESIS AND OBJECTIVES

The study aim was to evaluate associations between intake of red meat and processed meat for CRC and to know the gravity of the related factors in the process. This study analyze 17 publications from medical and food science journals in order to know the role of red meat on CRC developments. Should population change their dietary habits?

RED MEAT AS A PART OF A DIET

Red meat is a major source of **protein** and **heme iron**, which has an basic role on anemia's prevention.

Consumption of red meat also contributes many vitamins and minerals to the diet that are essential for health such as **zinc** and **vitamin B12**. The fatty acid profile (40-50%) of meat makes it a caloric, why its intake should be regulated.

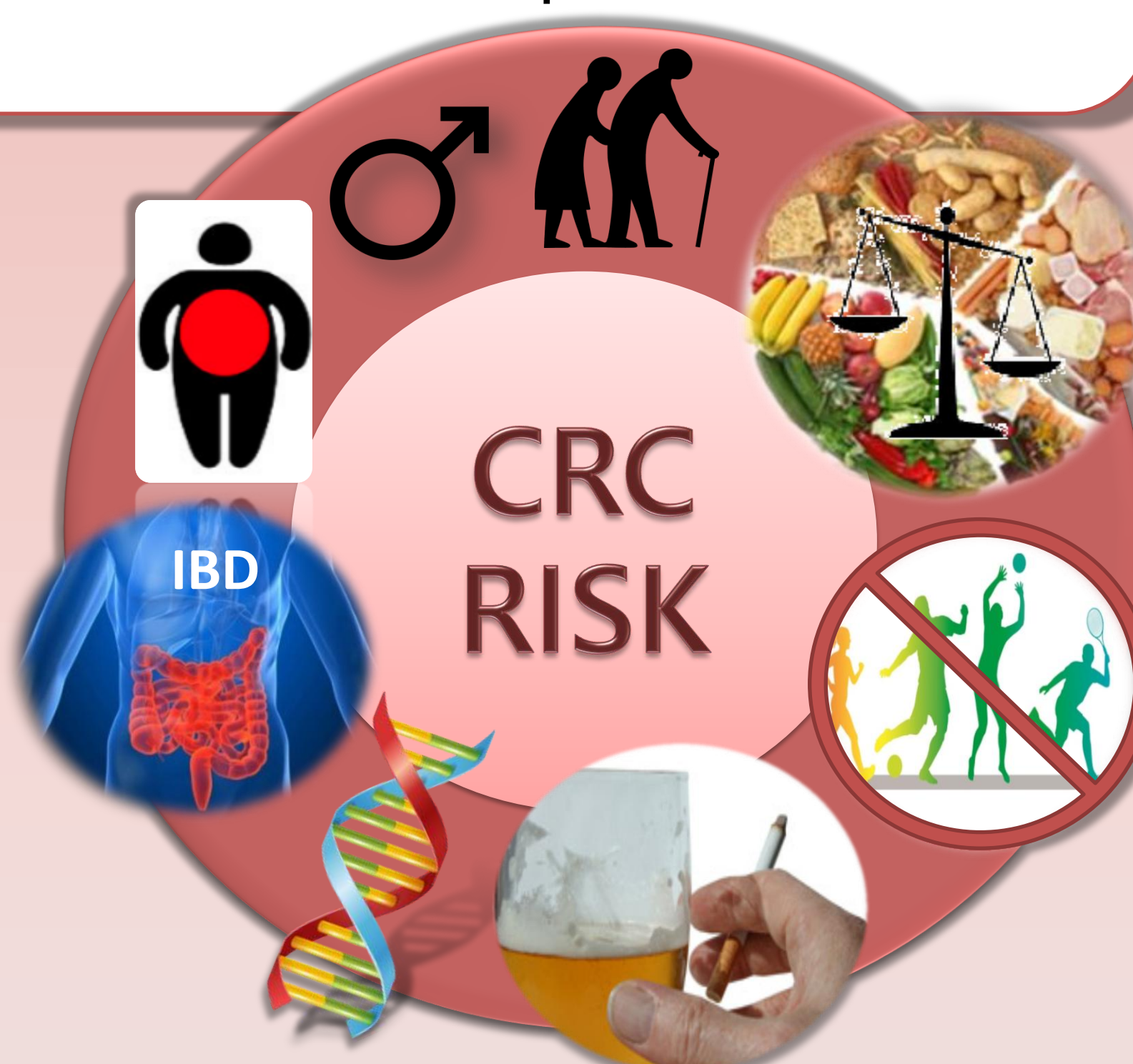
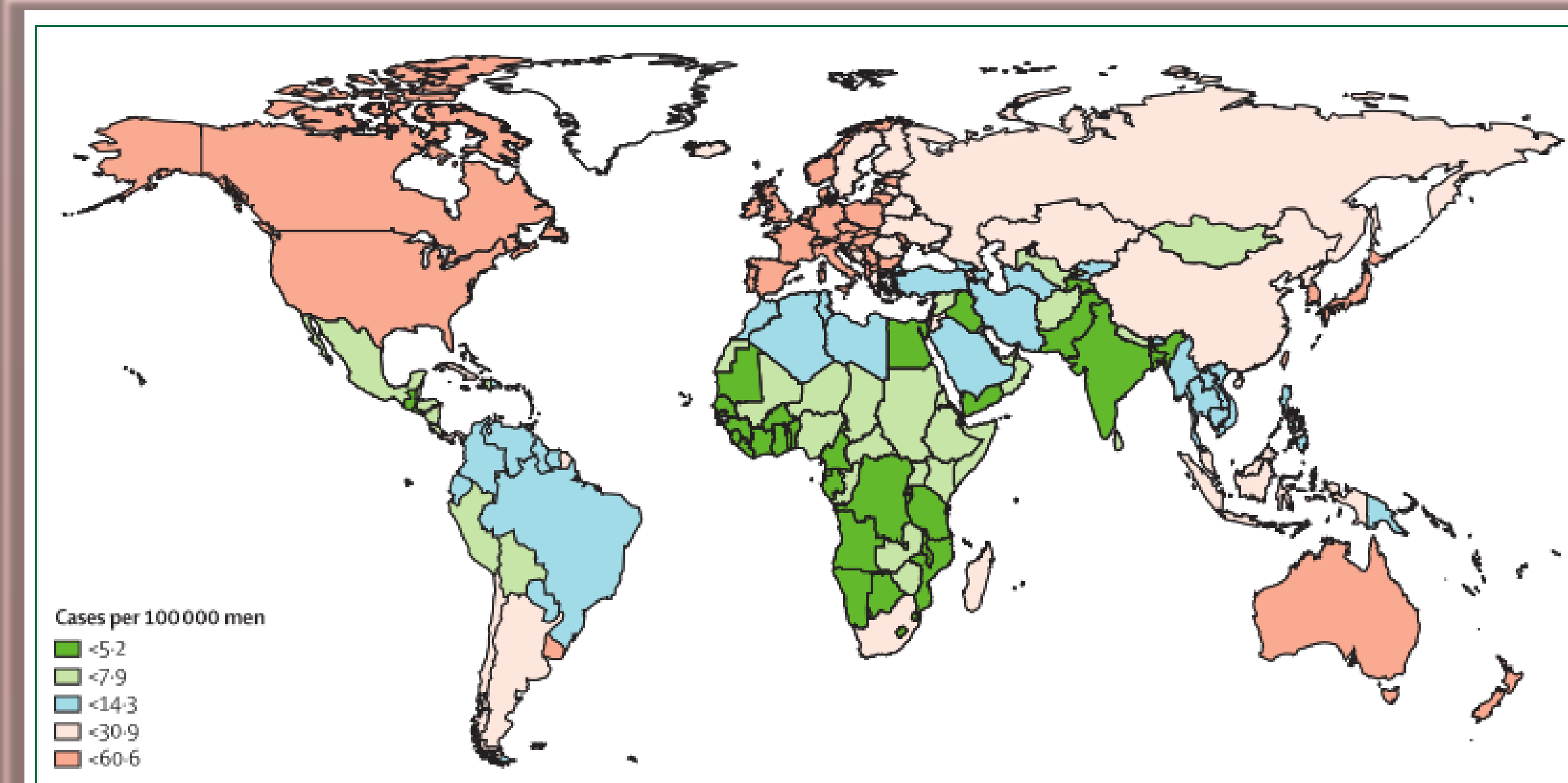


Figure 1: Estimated age-standardised colorectal cancer incidence for men in 2008. Data from Brenner *et al.*, 2014.



CRC: EPIDEMIOLOGY AND RISK FACTORS

The incidence of colorectal cancer (CRC) is rapidly increasing in developing countries, especially among populations that are adopting Western-style diets (figure 1). CRC is the most common cancer in both sexes global in Spain (15,8% of all cancers) and the second one with major mortality (14,3%), after lung cancer.

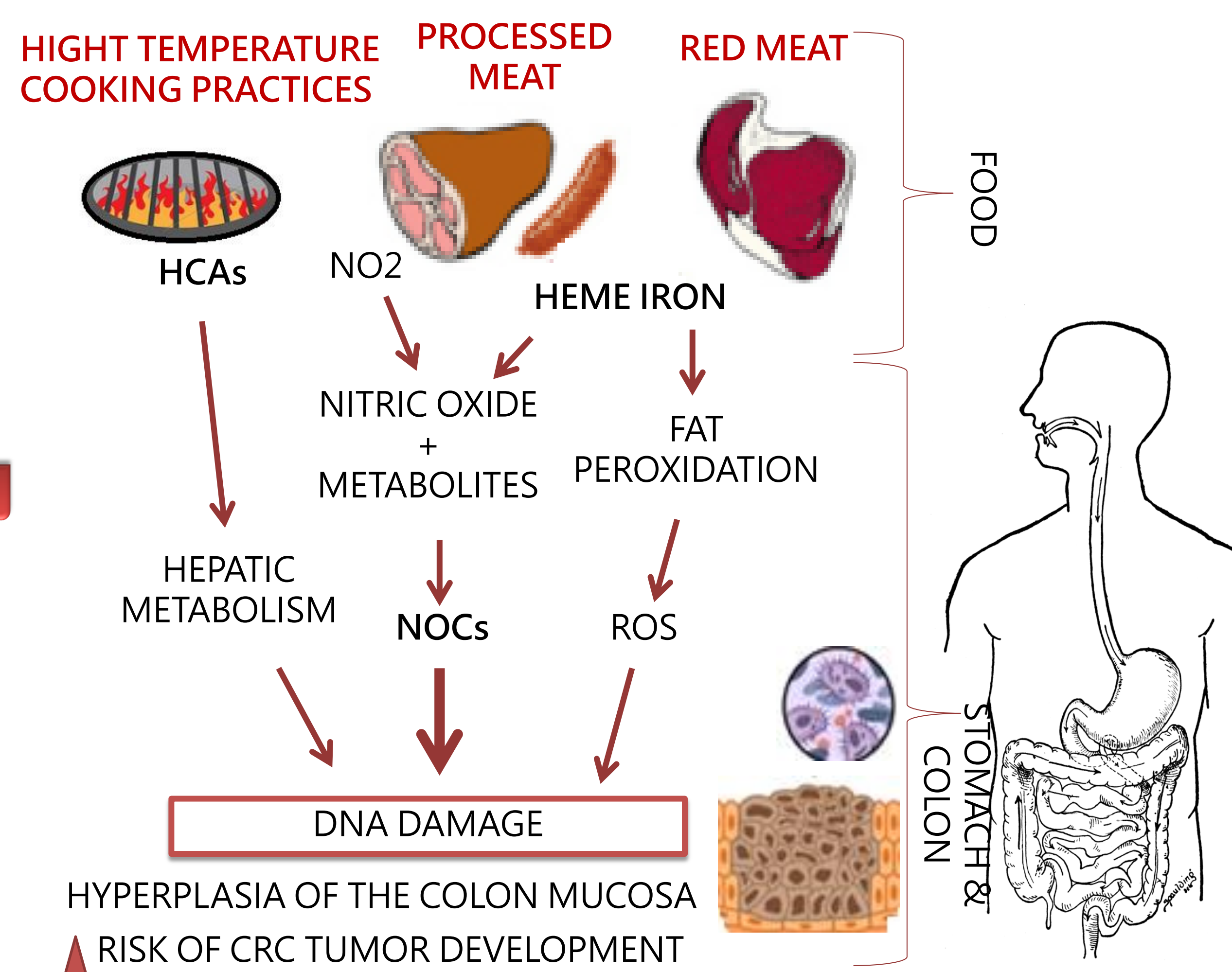
The complex nature of this disease and the large number of interacting risk factors hinders research.

POSSIBLE CARCINOGENIC FACTORS

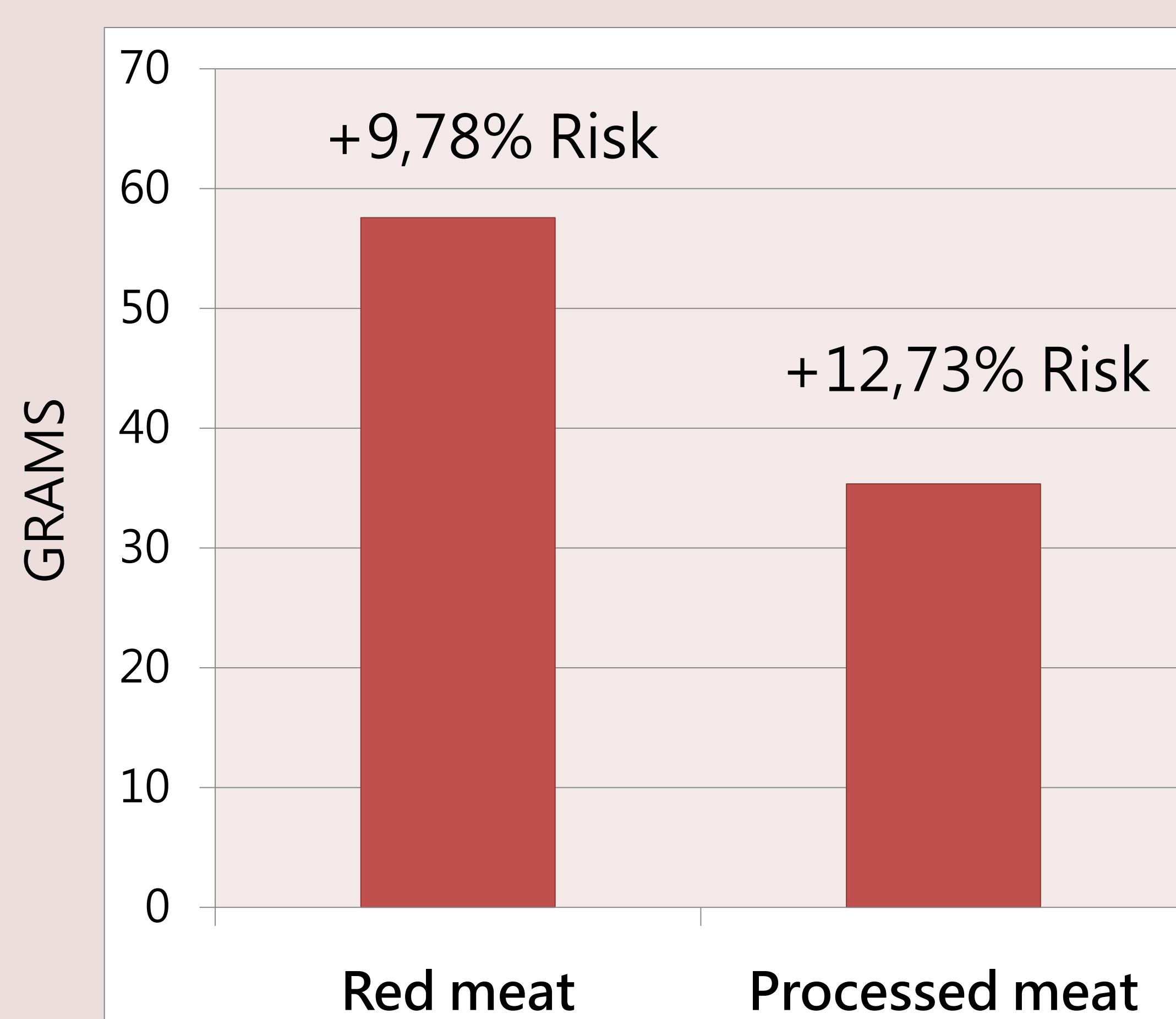
-Excess dietary **heme** causes oxidative stress response in the colonic mucosa. It also promotes endogen formation of NOCs. Delayed, dietary heme increases the cytotoxicity of the colonic contents simultaneously hyperproliferation.

-**N-nitroso compounds (NOCs)** can be formed endogenously or via nitrosation of organic compounds in meat by nitrite. Many NOCS are alkylating agents that altered normal cell proliferation by DNA carboxymethylation. Overcooked nitrite-cured meat shifts the antioxidant to pro-oxidant features. Nevertheless, there are divergences between studies.

†**Heterocyclic amines (HCAs)** are produced during high-temperature cooking of meat, especially grilling, frying and barbecuing, for extended times. Amino acids and creatine react to form a variety of HCAs, which become a genotoxic compounds during digestion. However, chicken has no been associated with a increased risk of CRC even though it contents major quantity of this component. So the implications of HCA in the process are uncertain.



CATALANS MEAT CONSUMPTION IN 2013



CONCLUSIONS

- Maintaining intakes of red meat , while reducing intakes of processed meat and meat cooked at very high temperatures will ensure a safety diet; however, it must be complemented with suitable quantities of vegetables and fruit.
- There is a need for further studies which search processes and food additives.
- Researchers need to collaborate with the meat industry and public health authorities in order to provide safer food and awareness campaigns to advice about cooking practices and balanced diets.