

Food and Nutrition: Emerging Challenges and Opportunities for Scotland.

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Challenges.

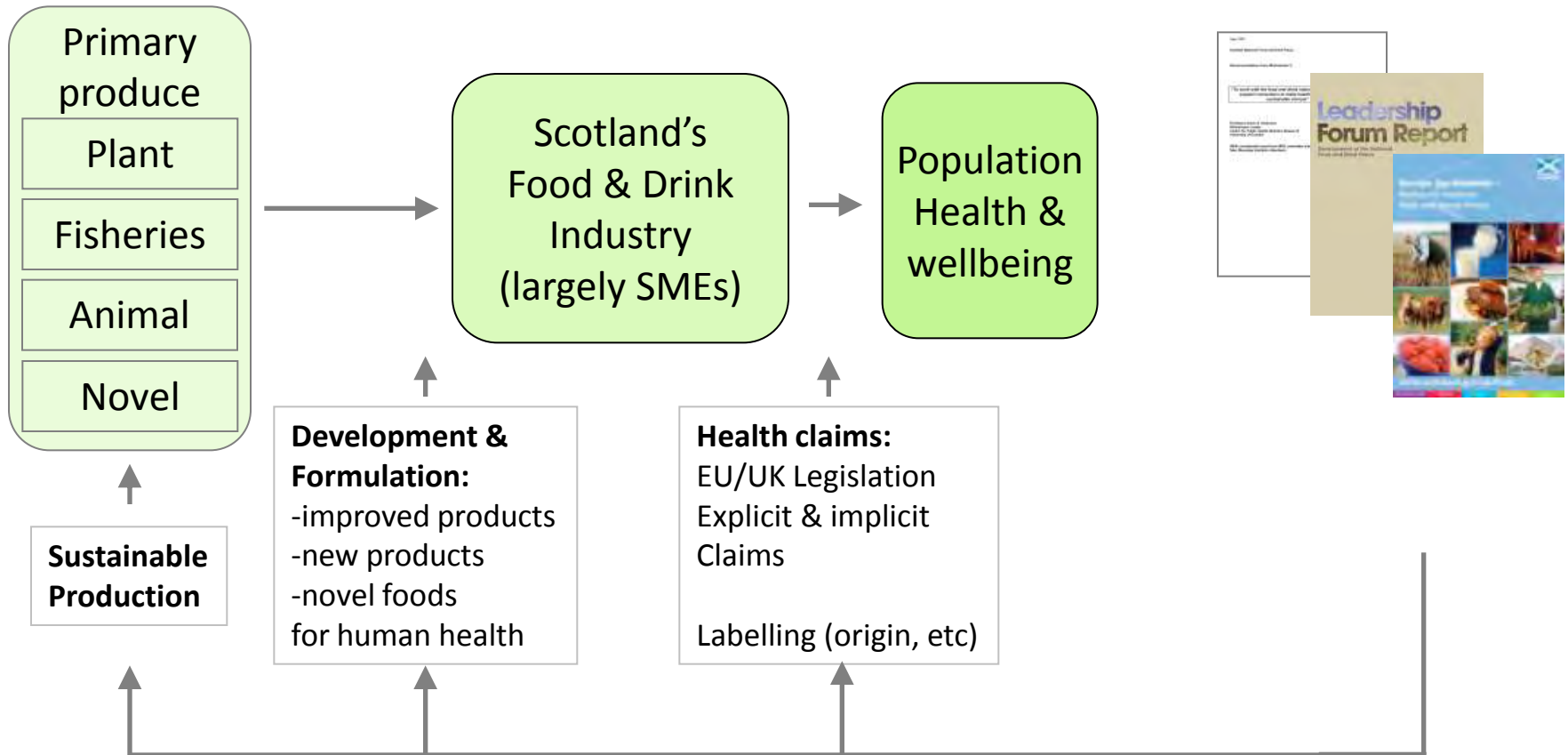
Research evidence and regulation.

Emerging Opportunities

- Sustainability
- Public health
- Technology

Challenges to Public Health

- Identify progress toward meeting dietary targets, and obstacles to progress
- Improve the quality of the Scottish diet
- Reduce inequalities and improve the health of deprived and vulnerable groups
- Provide consumers with information to make appropriate food choices



Challenges to Scotland's Primary Producers and The Food & Drink industry

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Evaluation of the evidence



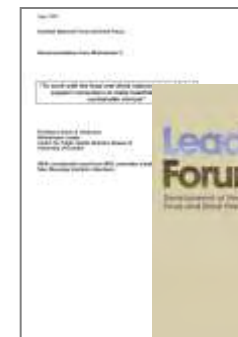
The Scientific Advisory Committee on Nutrition (SACN) is an advisory Committee of independent experts that provides advice to the [Food Standards Agency](#) and [Department of Health](#) as well as other [Government Agencies](#) and [Departments](#) and [Devolved Departments](#).



SACN carries out 'risk assessment'.

Its remit includes matters concerning:

- Nutrient content of individual foods
- Advice on diet
- Dietary reference values
- Nutritional status of the population



The Advisory Committee on Novel Foods and Processes (ACNFP) is a non-statutory, independent body of scientific experts that advises the [Food Standards Agency](#) on **any matters relating to novel foods and novel processes**.

The Committee carries out **safety assessments** of any novel food or process submitted for approval under the **EC novel food regulation**.

This can include novel ingredients, nanotechnology, GM, etc. Products may be developed for health benefit, economic, or other reasons.

The European Dimension



The [European Food Safety Authority \(EFSA\)](#) is the keystone of European Union (EU) risk assessment regarding **food and feed safety**. In close collaboration with national authorities and in open consultation with its stakeholders, [EFSA](#) provides independent scientific advice and clear communication on **existing and emerging risks**.

Its remit includes:

- **Food Safety**
- **Dietary Reference Values**
- **Health Claims**
- **Novel Foods**

Challenges.

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Diet and Health

Opportunities;

- emphasise, and capitalise on, the health giving properties of Scottish produce
- contribute to the improved dietary health of the population
- increase market share and profitability of Scottish produce.

Art. 13 functional claims: Between July and December 2008 the European Commission submitted to EFSA a draft list of **over 4,000** claims; a rationalisation of **44,000** applications.



Activities;

- Improve nutritional characteristics of primary plant, animal and marine produce
- Reformulation of foods in response to dietary and nutritional recommendations
- Develop Health Claims and Novel Foods



Sustainability

Climate change – global commodity instability – pressures on the food supply chain (land use conflicts, biofuels, organics, ...).

These are likely to result in profound changes in the human diet by;

- altering the types of soils on which plants are grown
- the types of crops produced
- breeds of animal produced for food
- animal feedstuff used
- introduction of entirely novel sources of food



There is an urgent need to understand the implications for human health of changes in the food supply chain before they are implemented.

Contribution of Technology



Example Technologies

- GM (genetic modification)
- GM lite (epigenetic modification)
- Nanotechnology

Considerations

- Effectiveness
- Environmental effects
- Effects on human health
- Societal acceptance

Obesity; the public health challenge.

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Scottish obesity 'just behind US'

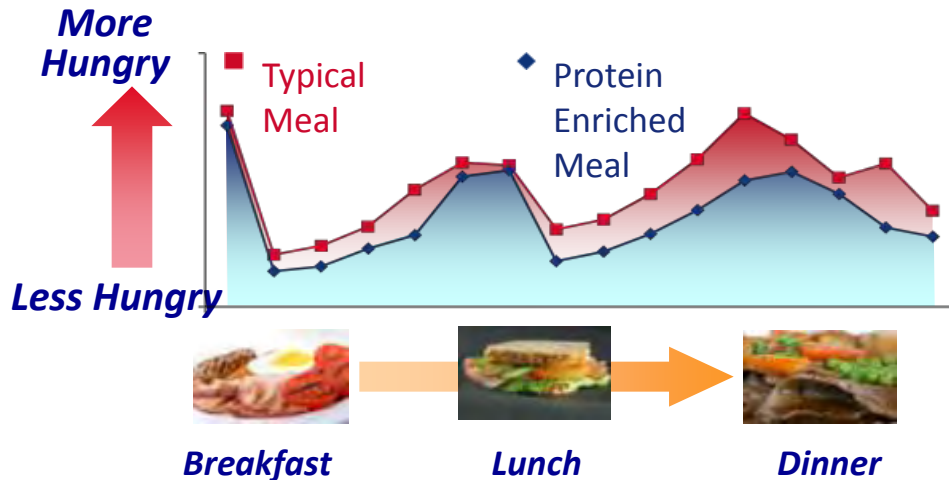
Obesity levels in Scotland are the second highest in the developed world behind the USA, new statistics have revealed.

The figures were published as the Scottish Government announced plans to remove sweets and fizzy drinks from schools.



Obese people in Scotland are 18% more likely to be hospitalised

Food innovation: obesity



Launch of 'Simply Fuller Longer' range
(M&S HQ, London November 27th 2010)

Pharmaceutical approaches to reducing obesity have had little success (and some recent high profile failures).

Satiety can be altered simply by changing the macronutrient composition of foods.

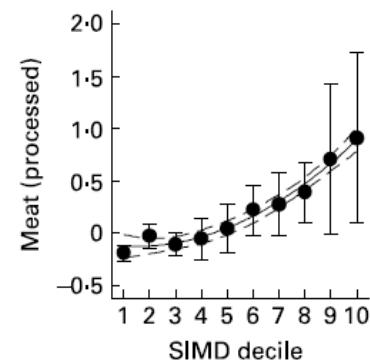
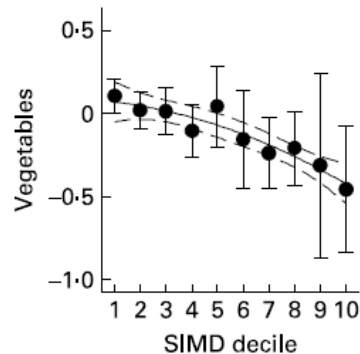
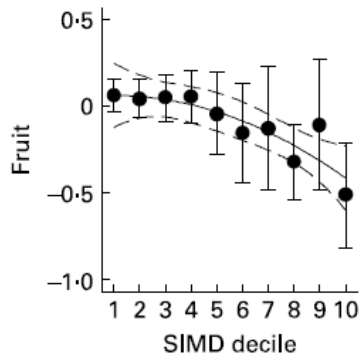
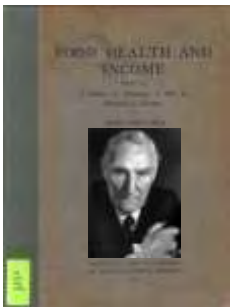
Opportunities to develop healthy, safe and realistic dietary strategies to reduce the problem of obesity.

Food technology innovations (e.g. nanotechnology) are greatly expanding the possibilities for dietary effects on health.

Diet and Health inequalities

Health inequalities linked to poor diet include higher risk of heart disease, stroke, some cancers, dental decay and, increasingly, obesity. Closing this gap is an important goal for Scotland.

Many UK health policies designed to tackle the problem of inequality are aimed at improvement of the diet in poorer socio-economic groups but these have met with very limited success.



Poor diets in the 21st century have adequate energy but nutrient imbalance.

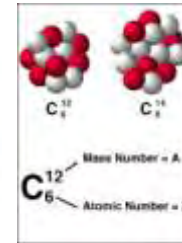
The way such diets influence health and how they interact with other factors associated with deprivation is poorly understood.

Vitamin D.



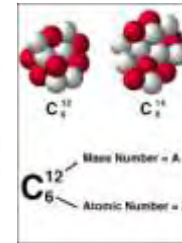
- Skin exposure to UV irradiation of the appropriate wavelength is essential for maintaining adequate vitamin D status.
- At latitudes of about 52°N and above, there is no ultraviolet light of the appropriate wavelength for the cutaneous synthesis of vitamin D. For the remaining months, more than half the effective UV radiation occurs between certain times (1100 and 1500 hours) and is lower in the north than the south.
- Vitamin D may be a unique nutrient in that the Scottish dietary requirement may differ from the UK dietary requirement.
- vitamin D status implicated in Osteoporosis - several forms of cancer - cardiovascular disease – Tuberculosis -multiple sclerosis - type I diabetes.

Nutrient Fingerprinting



Natural variations in isotope abundance can be used to identify the origin and history of nutrients in complex food mixtures and human tissues.

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Applications

Food and Drink Industry (traceability/provenance):

- Identify the origin/history/provenance of nutrients and foods.



Human Health:

- Population scale evaluation of the origin of nutrients in the human diet.
- Population scale monitoring of policy recommendations.
- Population scale estimation of human metabolic response to diet.



Human variation in response to diet.



- Most human health outcomes have a high heritability (implied genetic component).
- Individuals differ in their response to diet in reproducible ways.
- The human genome has been fully sequenced.
- A number of genes are known to influence the metabolic response to diet.

The value of these discoveries:

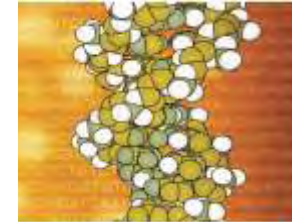
- NOT personalised nutrition (see SACN 2008 Statement on Genetic Testing)
- New ways of establishing nutritional causality in human health.
- Improved selection of biomarkers (early predictors of response to diet).
- Better verification of dietary intake data in research studies.

How does Diet Influence Human Health?



Nurture

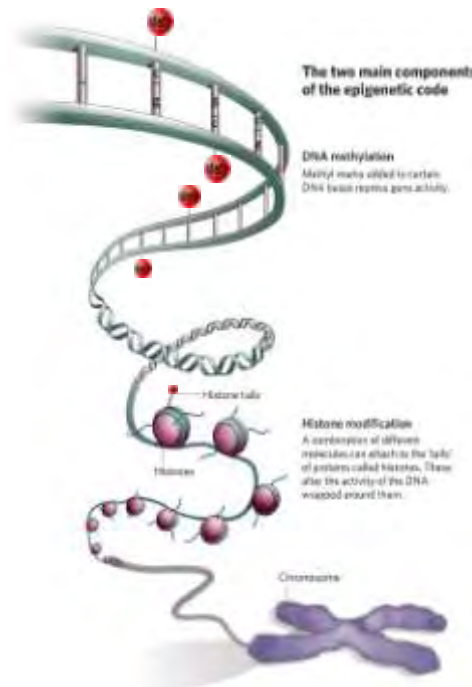
Epigenetics



Nature

“The role of epigenetics in common diseases has been underestimated - it’s the new frontier”

NATURE VOL 421 13 FEBRUARY 2003

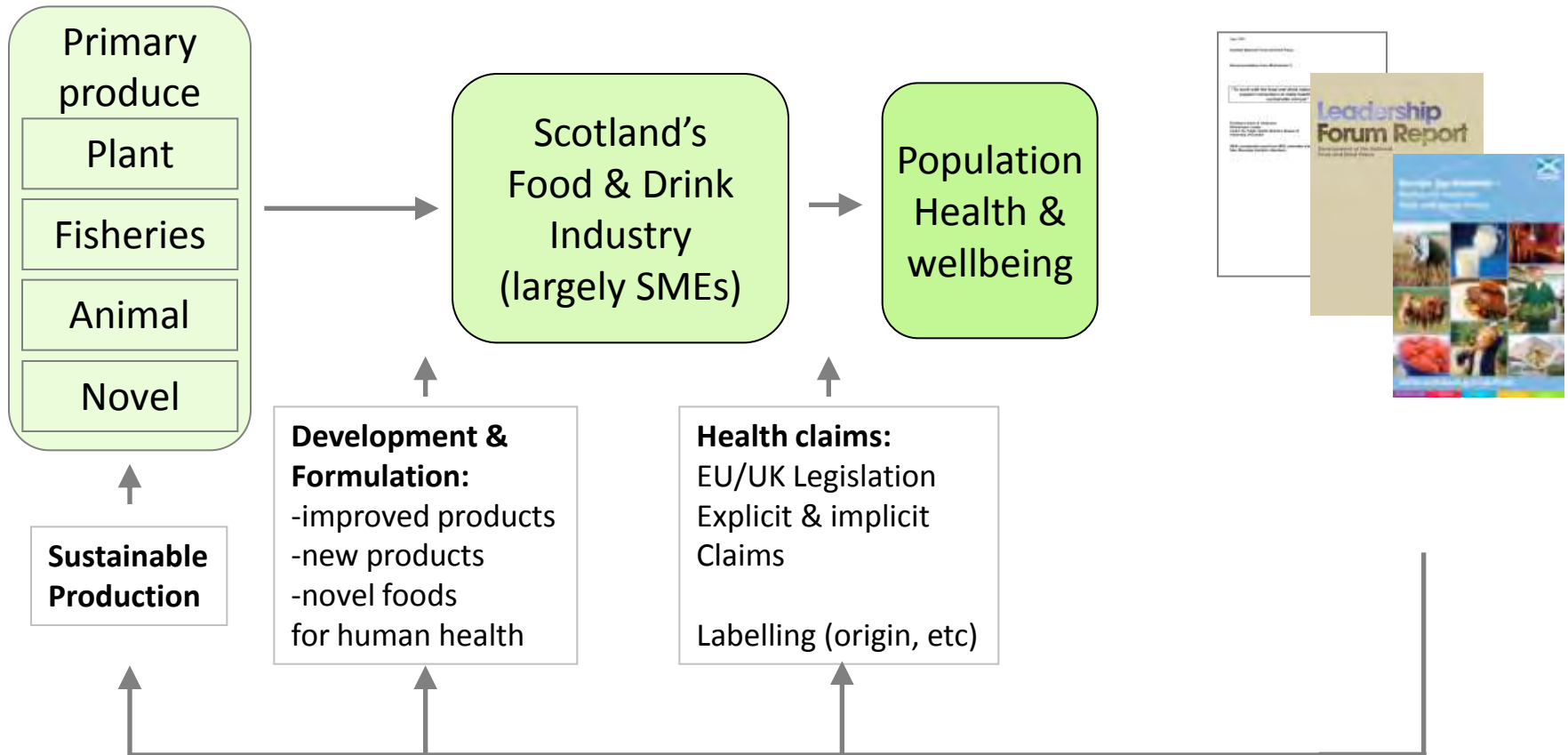


Epigenetics is emerging as a critical area where diet, lifestyle and genes interact to influence the health of this generation and potentially the next.



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