

Estimating the nutrient value of agricultural products in Scotland

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Responses to the Scottish Government commitment to Net Zero will increase the demand for land from multiple sectors in Scotland and potentially take land out of food production.

Choices about where and what foods are produced is important for both nutritional security, but has rippling consequences for land use, identity and the food system.

Food security goes beyond averting hunger and includes prevention of nutrient deficiencies.

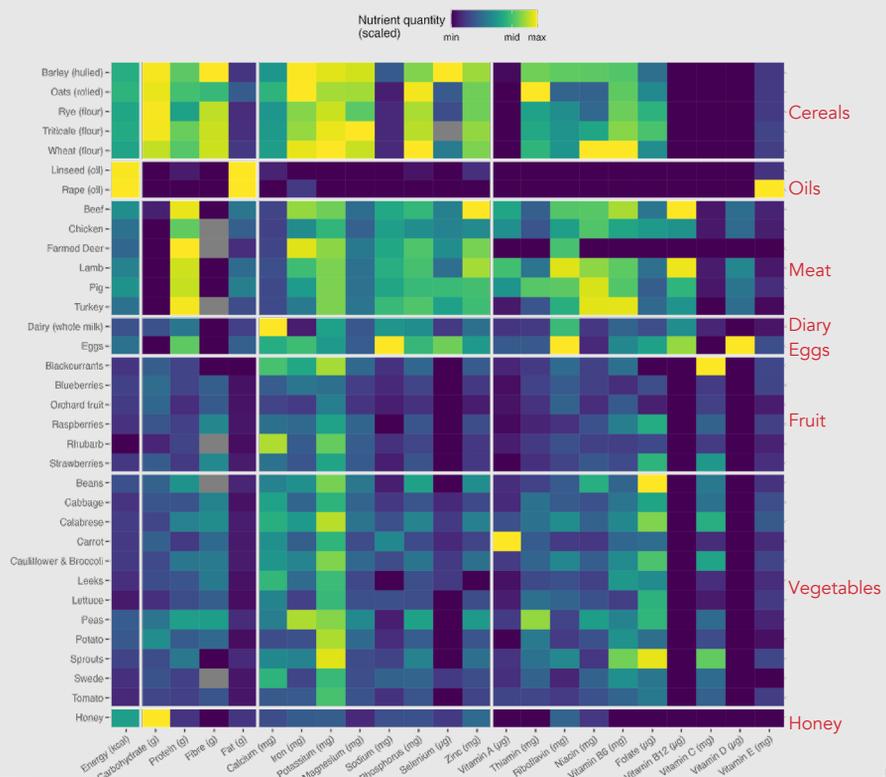
To support choices about where and what might be produced, we present an estimate of the nutritional value of agricultural commodities produced in Scotland.

We focus on the value of the least processed form of each commodity, before food processing and ingredients from elsewhere are incorporated. This does mean that the nutrients estimated are not the same as those that consumers access at the point of sale. For example, we estimate the nutrient value of wheat in the form of whole flour, whereas people eat bread, pasta and biscuits.

Commodities were identified from the Scottish June Agricultural Census and were linked to foods from the UK Composition of Foods Integrated Dataset that lists the nutrients of over 3,200 foods.

Fig. 1 Estimated nutrient content per 100g of food .

The colour shows how much of each nutrient (columns) is in 100g of each commodity (rows). The colours are scaled between the minimum (dark blue) and maximum (yellow) value across commodities (rows).



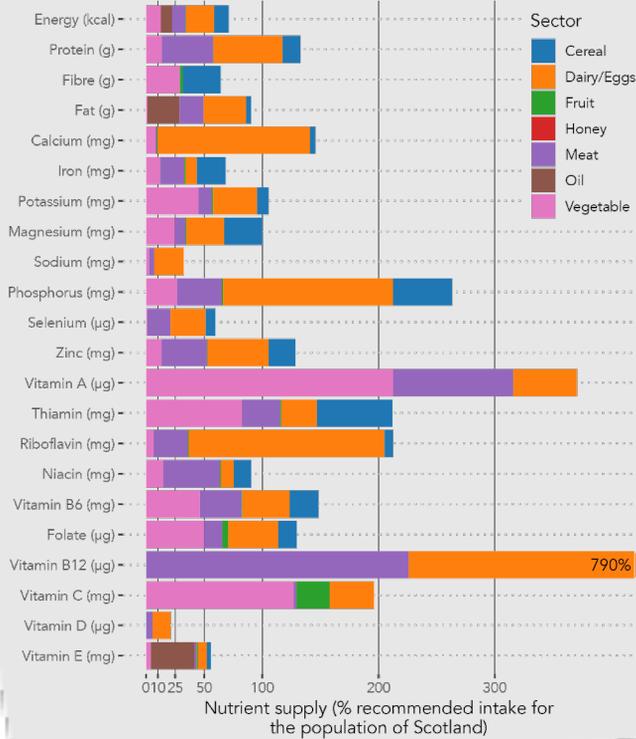


Fig. 2 Estimated supply of nutrients for human consumption from agricultural production in Scotland.

The nutrients from 100g of food are multiplied by the average quantity of each commodity produced (in tons) for a year. Commodity quantities were then adjusted for the loss of nutrients from harvesting waste, the conversion of commodity into food, the fraction of the commodity that was used for human consumption, and the edible fraction of food.

The supply of each nutrient, ignoring imports and exports, is shown by sector (colours) and is relative to the recommended dietary guidelines for how much of each nutrient the population of Scotland require to have a healthy life.

No one commodity provides all our nutritional needs (Fig. 1). A balance of foods is therefore needed. Current production is a mixture of which commodities are produced, in what quantities and, how much is used for human food. We did not adjust for imports and exports, but if all produce in Scotland were consumed here, we can consider the theoretical supply of nutrients (Fig. 2).

- Cereals could provide many macronutrients and minerals as they are a good source of nutrients (Fig. 1), but are mostly used for non-food products so their realised contribution is attenuated (Fig. 2).
- Vegetables are an important source of nutrients despite relatively little hectareage. The nutrient supply is largely driven by large yields of potato and carrot.
- Milk is a key source of both minerals and vitamins nutrients given the amount made.
- Livestock, both meat and dairy, use a significant proportion of agricultural land for

support (fodder crops, animal feed and grazing). The contribution of meat to nutrient supply does not align with the proportional land use.

- There are additional products that are exclusively used as livestock feed that contribute indirectly to nutrient supply (through meat and dairy).

Processing of foods, whether produced in Scotland or imported, is complicated and changes the supply of nutrients. About half of the diet in Scotland is based on imported foods (more for fruit and vegetables). Nutrients also come from aquaculture, which is not considered here.

Understanding the potential and realised nutrient supply from domestic agricultural production helps to evidence a discussion about how agriculture is valued, the opportunities to reimagine food production to maximise the supply of nutrients across Scotland and consider uses of land.



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