



HELIOS RENEWABLE
ENERGY
PROJECT

Preliminary Environmental Information Report

Volume 3: Technical Appendices

Appendix 14.4 : Analysis of UK Food
Security

APPENDIX 14.4

Note About UK Agriculture

BRIEFING NOTE: SELF-SUFFICIENCY OF UK AGRICULTURE

June 2023

Purpose of this Briefing Note

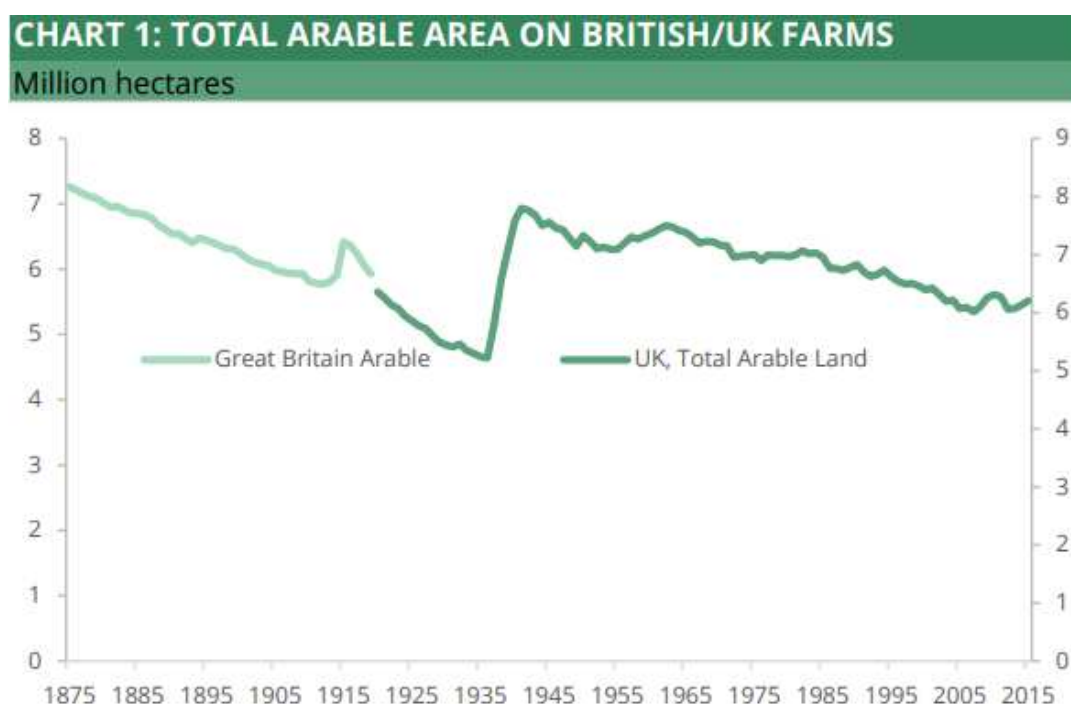
- 1 This paper examines the current position in respect of food security and self-sufficiency in the UK. The references for all documents are provided at the end.
- 2 The Government's stated position is that **"the UK has a large and highly resilient food supply chain. Our high degree of food security is built on supply from diverse sources: strong domestic production as well as imports through stable trade routes"** (Defra Press Release 6th December 2022).
- 3 This paper sets out some of the available statistics and related commentary, to examine the facts and statements about food production and food security.
- 4 This paper:
 - sets out the key industry resource statistics;
 - sets out the key statistics by farming sector;
 - sets out related commentary; and
 - and ends with a summary.
- 5 The paper focusses primarily on England, but some statistics are only available on a UK-wide basis. Therefore there is a degree of mixing embedded in this paper.

Structure of the Industry's Assets

- 6 The latest Government informationⁱⁱ is that England has a land area of 13,046,000 hectares (32.2 million acres).
- 7 Defra estimate that the Utilised Agricultural Area (UAA) in England at 1st June 2022 was 8.9 million hectaresⁱⁱⁱ.

- 8 Natural England estimate that 42% of agricultural land is best and most versatile (BMV) (ALC Grades 1, 2 and 3a)^{iv}. That would equate to 3.74 million ha (9.24 million acres) of utilised agricultural land that is of BMV quality.
- 9 UK soils currently store about 10 billion tonnes of carbon, equal to about 80 years of annual greenhouse gas emissions^v.
- 10 The Environment Agency^{vi} concludes that soil biodiversity and the many biological processes and soil functions that it supports "**are thought to be under threat**". The statistics presented conclude that:
- almost 4 million hectares of soil are at risk of compaction;
 - over 2 million hectares are at risk of erosion;
 - as a result of intensive agriculture use arable soils have lost 40% to 60% of their organic matter.
- 11 The total arable area on UK farms has been declining since 1875, with a reversed trend in the 1935-1945 period, as shown below.

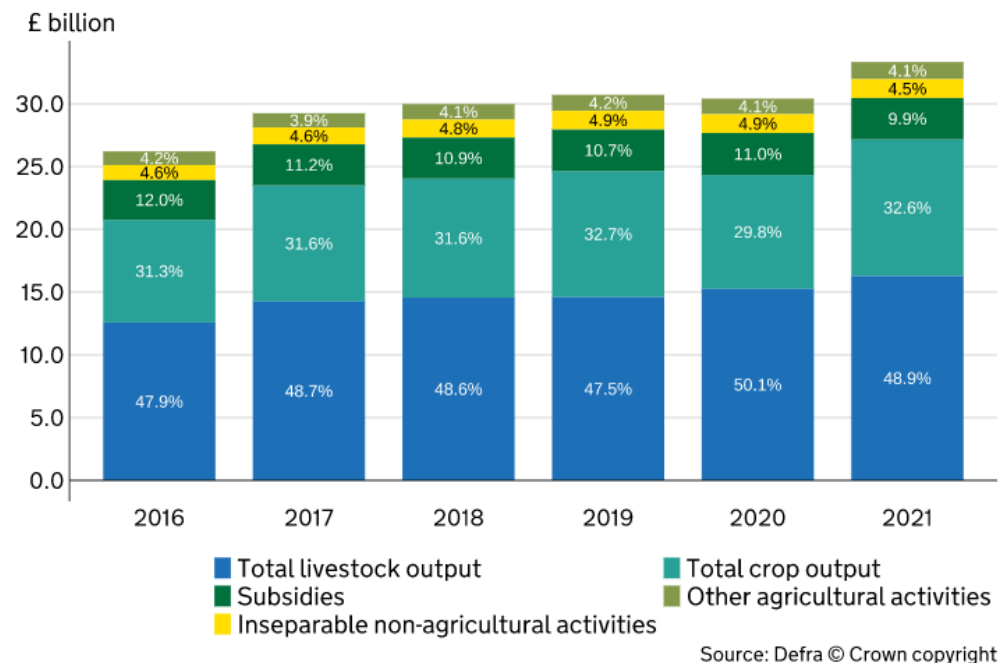
Insert 1: Arable Area on UK Farms^{vii}



- 12 Agriculture and fishing contribute £11.5 billion to the agri-food sector, which is about 10% of the £116.2 billion the sector contributes to the national Gross Value Added^{viii}.

13 In 2021 subsidies still provided almost 10% of income to the agricultural sector, as shown below. The subsidy regime has since been changed and this proportion is expected to decline in future years.

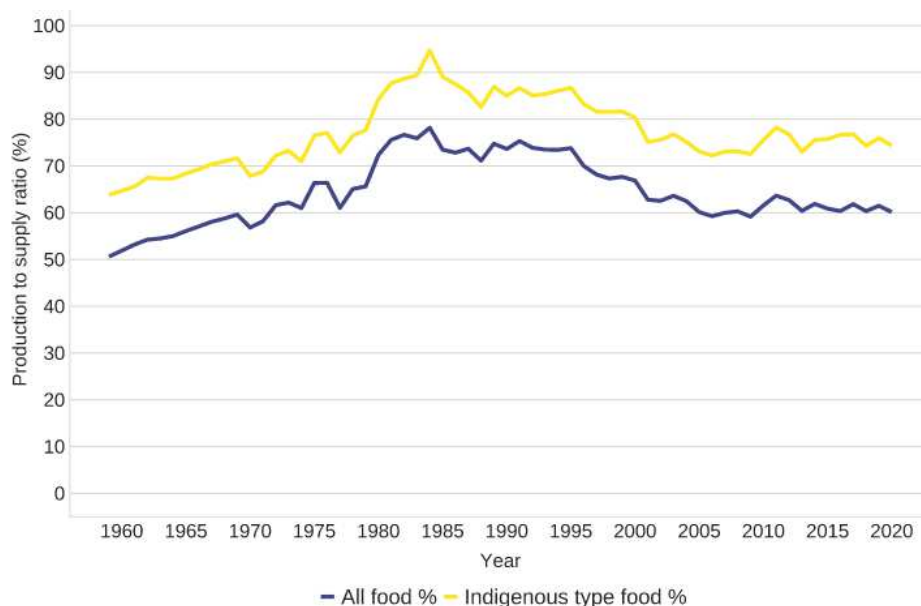
Insert 2: Summary of Outputs and Subsidies



Production Statistics

14 The UK Food Security Report 2021^{ix} identifies that the UK produces about 60% by value of the food we eat, but that rises to 74% of the food we can grow or rear in the UK.

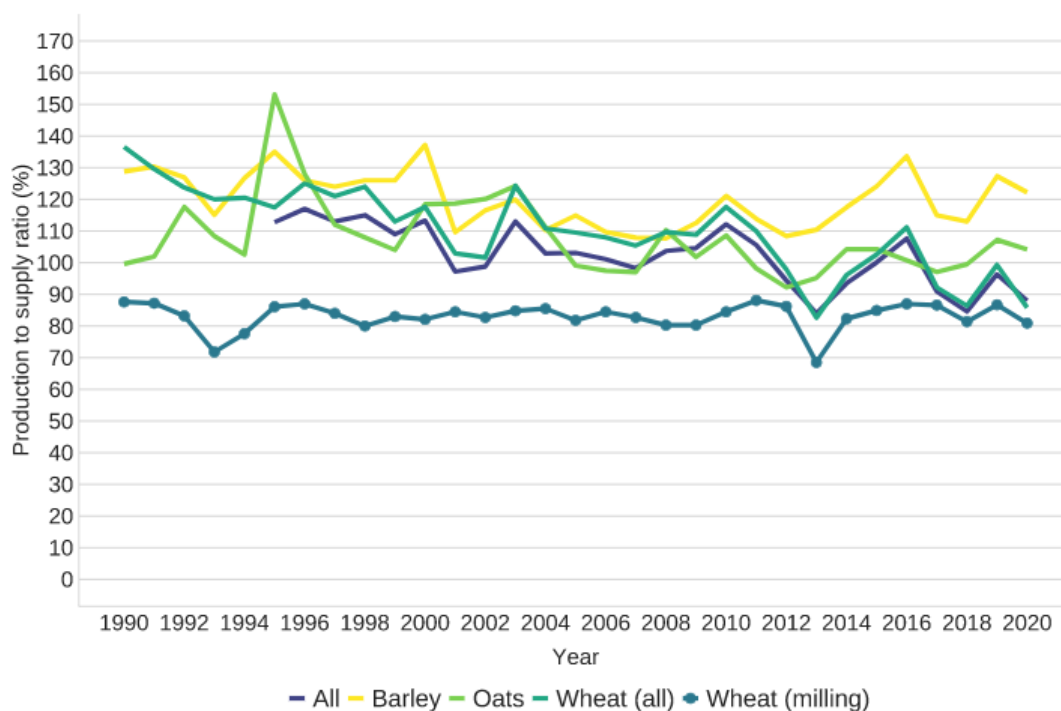
Insert 3: UK Food Production and Supply



15 **Cereals.** Wheat plays a vital part in the UK’s diet, environment and economy. The Food Security Report records that over the 1961 to 2011 period wheat accounted for about 30% of daily food energy intake per person. Wheat is consumed in bread, bakery products, breakfast cereals, pasta, in meat from animals fed on wheat, and in some alcoholic drinks.

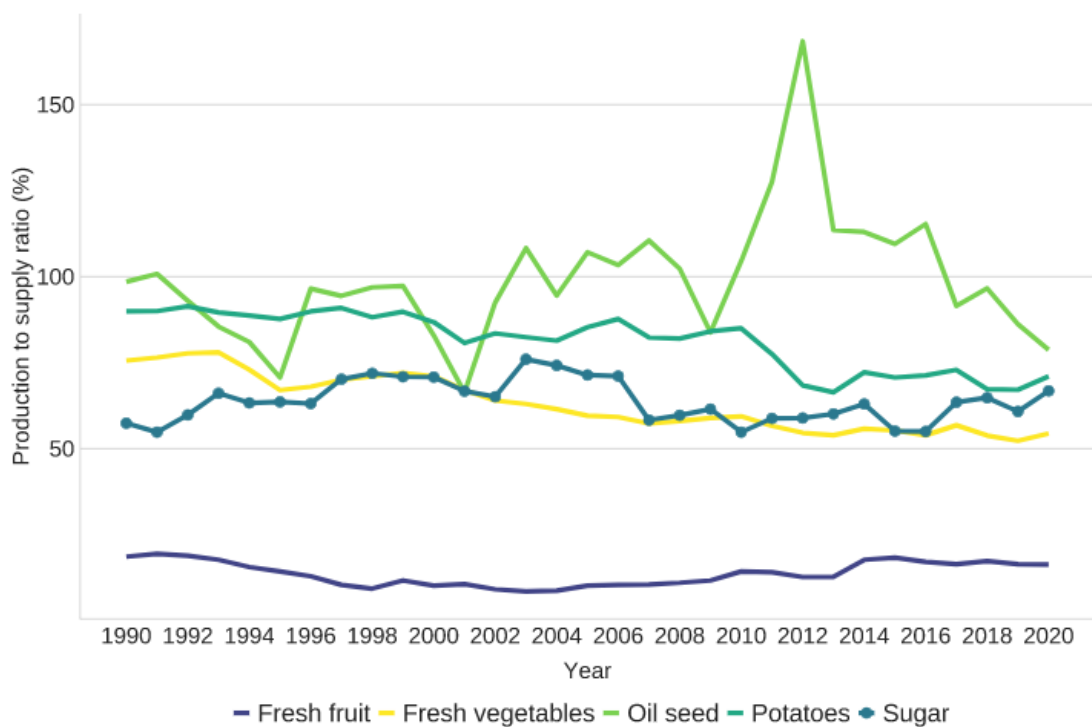
16 In terms of grains the UK is able to grow more cereals than we consume. Only in milling wheat are we producing less than we consume, but the shortfall is largely made up of hard wheats not suited to the UK’s climate and soils. We export cereals and import cereals of a different type or grade, due to climatic limitations.

Insert 4: Domestic UK Grain Production as Percentage of Consumption



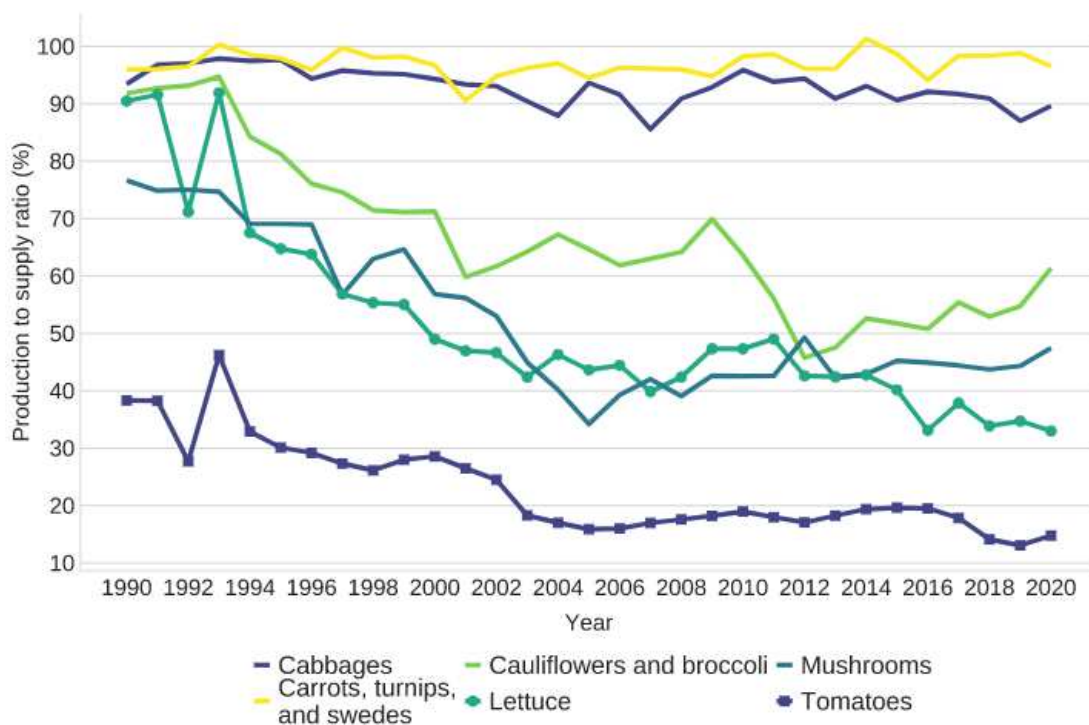
17 **Other Crops.** Self-sufficiency in other products is generally below 100% except for oilseed. Oilseed production has recently dipped significantly due to controls over the chemical applications permitted to control stem flea beetle.

Insert 5: Domestic UK Production of Other Crops as a Percentage of Consumption



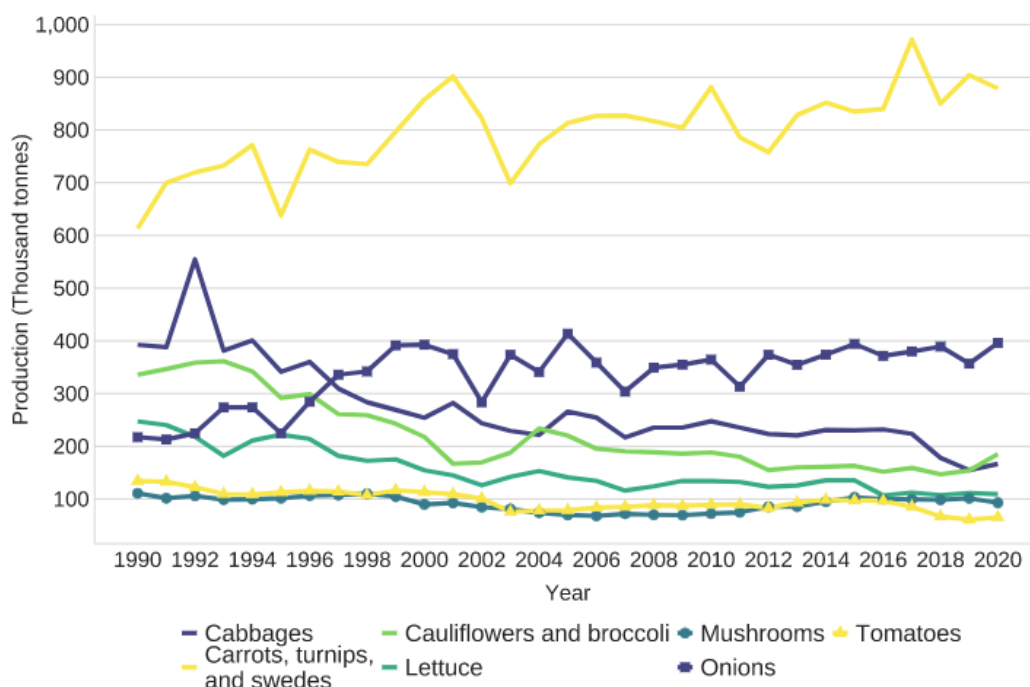
18 The trends for field vegetables show a generally-downward trend. Self-sufficiency exists in cabbages, swedes, turnips and carrots, but there have been falls in other vegetables, where domestic production has declined significantly.

Insert 6: Domestic UK Production of Fresh Vegetables as Percentage of Consumption



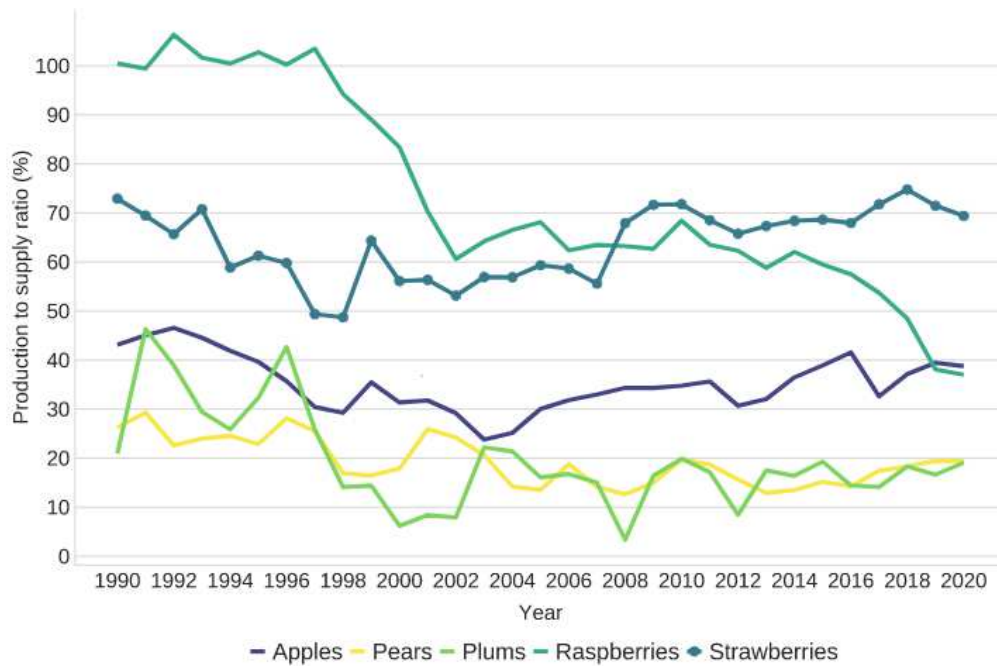
19 The production figures illustrate the caution that should be applied to self-sufficiency figures above. It will have been seen in Insert 6 that self-sufficiency in cauliflowers and broccoli is less than in 1990, although improving. In terms of production, cauliflower production has fallen to a third yet broccoli production has tripled. Onion production and carrot production are up (80% and 60% respectively) whilst swedes and turnips are no longer as much in favour.

Insert 7: Domestic UK Production of Fresh Vegetables



20 **Top and Soft Fruit.** UK production fell sharply in the 1990's, but has been steadily increasing since 2000. Domestic production of apples, for example has fallen from over 350,000 tonnes in 1992 to around 200,000 tonnes in 2020. The area of orchards has fallen from over 100,000 ha in the 1940's to around 20,000 ha today^x

Insert 8: Domestic Fruit Production as a Percentage of Consumption

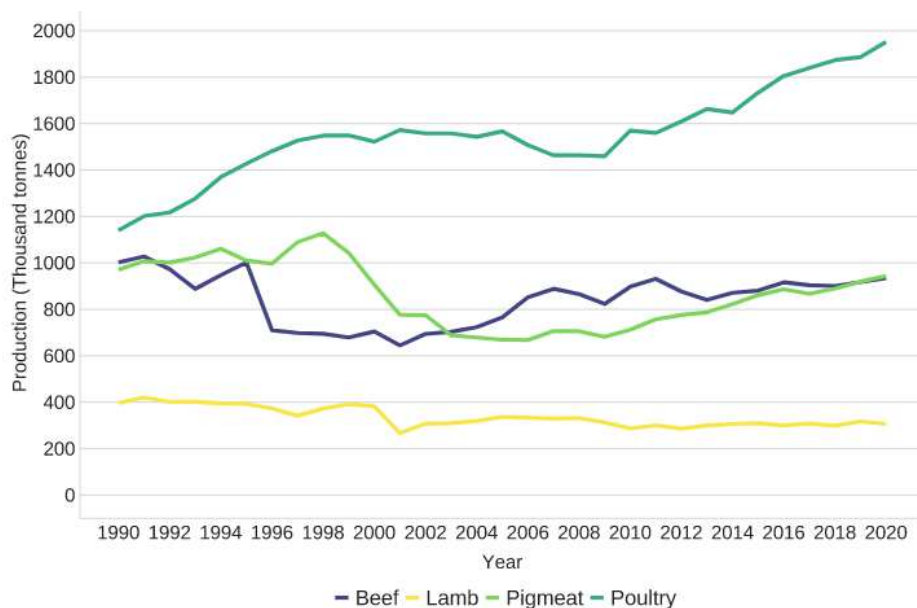


21 **Livestock.** Self-sufficiency is high. In 2020 production per person equated to:

- 61kg meat;
- 227 litres of milk; and
- 172 eggs.

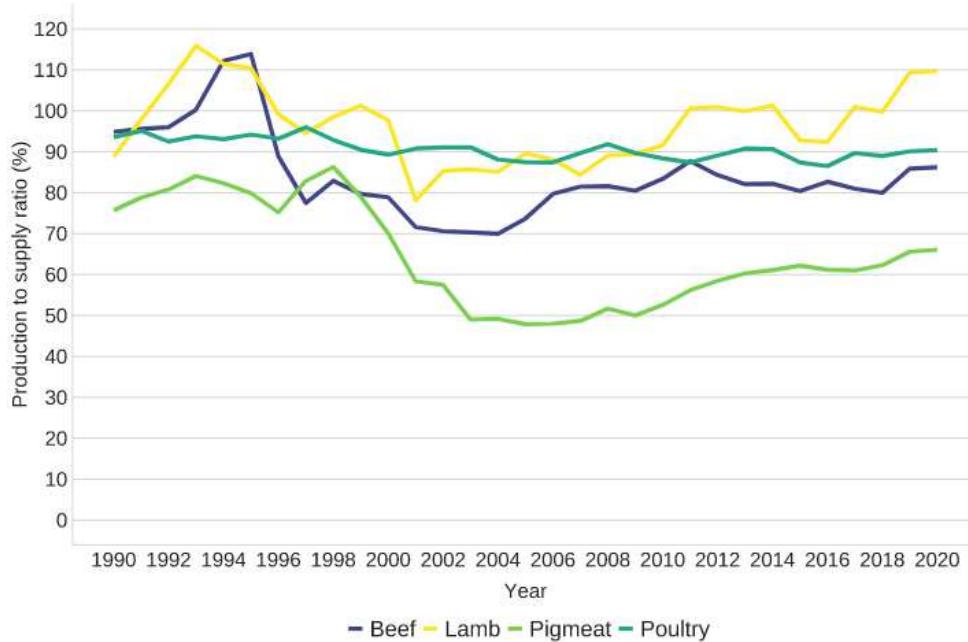
22 **Meat.** Production, especially of poultry meat, has been gradually increasing, as shown below.

Insert 9: Domestic Meat Production



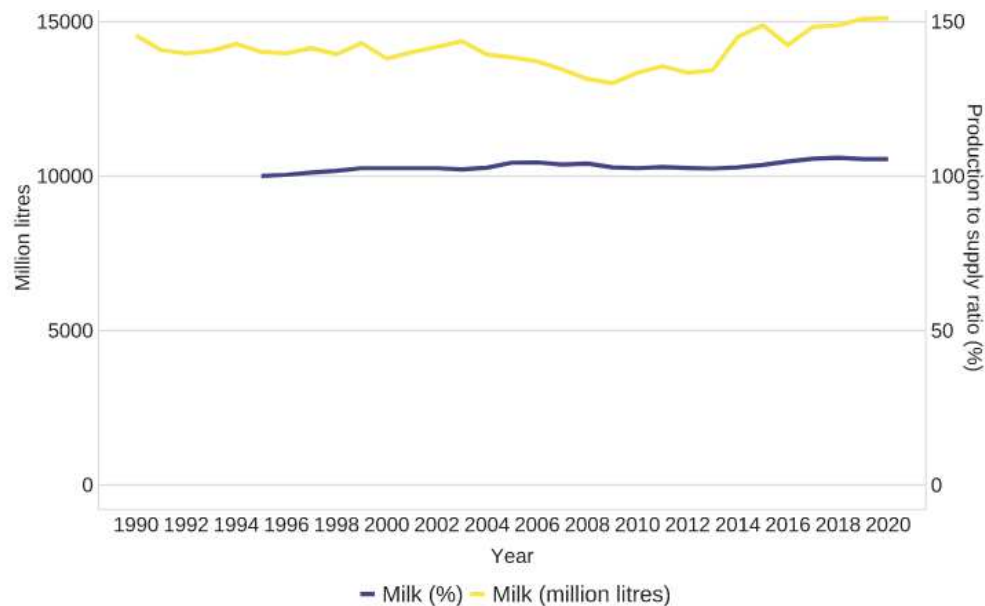
- 23 Due to consumer preferences, the UK exports lower-value products and imports higher-value products, but overall we are largely self-sufficient in terms of production.
- 24 Pig meat production has fallen sharply, with a recent recovery, but that reflects industry economic performance rather than an inability to produce the product.

Insert 10: Domestic UK Meat Production as a Proportion of Consumption



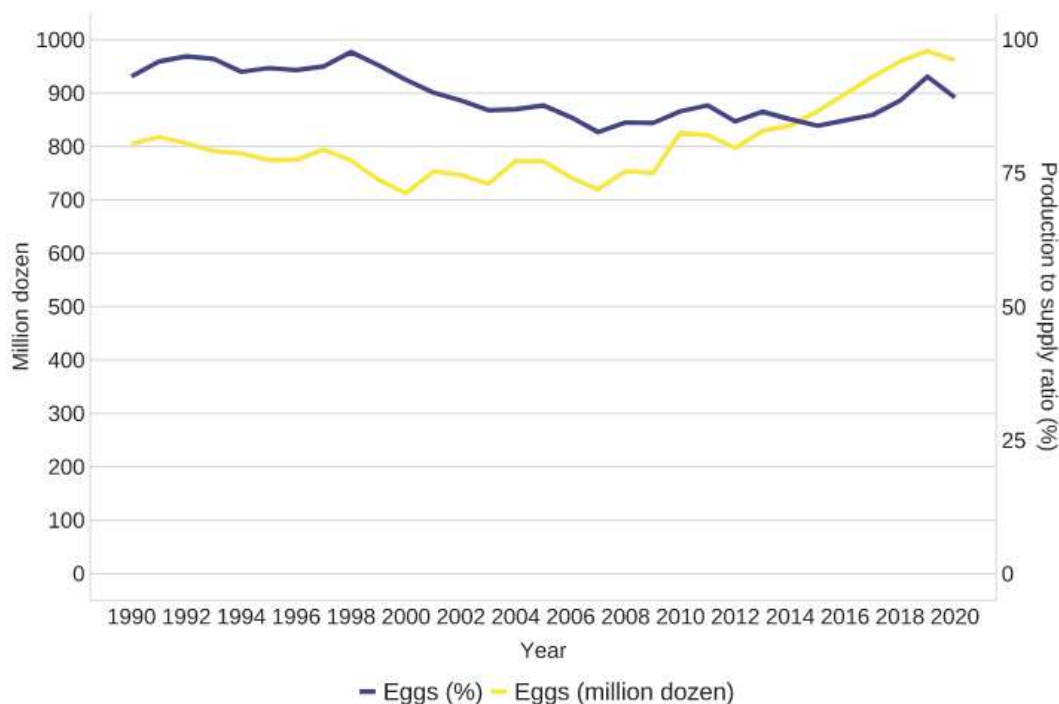
- 25 **Milk.** Milk production has held steady over the last 30 years, despite the herd size decreasing (down to 1.9 million cows from 3.5 million cows in 1973). Production exceeds consumption.

Insert 11: UK Raw Milk Production and Consumption



26 **Eggs.** Over the last 30 years egg production has met between 89% and 98% of domestic consumption. The laying flock decreased from 53 million in 1984 to 40 million in 2020, mostly declining in the 1980's and 1990's with a move from caged to free-range systems.

Insert 12: Domestic UK Egg Production and Consumption



Commentary

27 The statistics show self-sufficiency or near self-sufficiency in many of the staples of the UK diet:

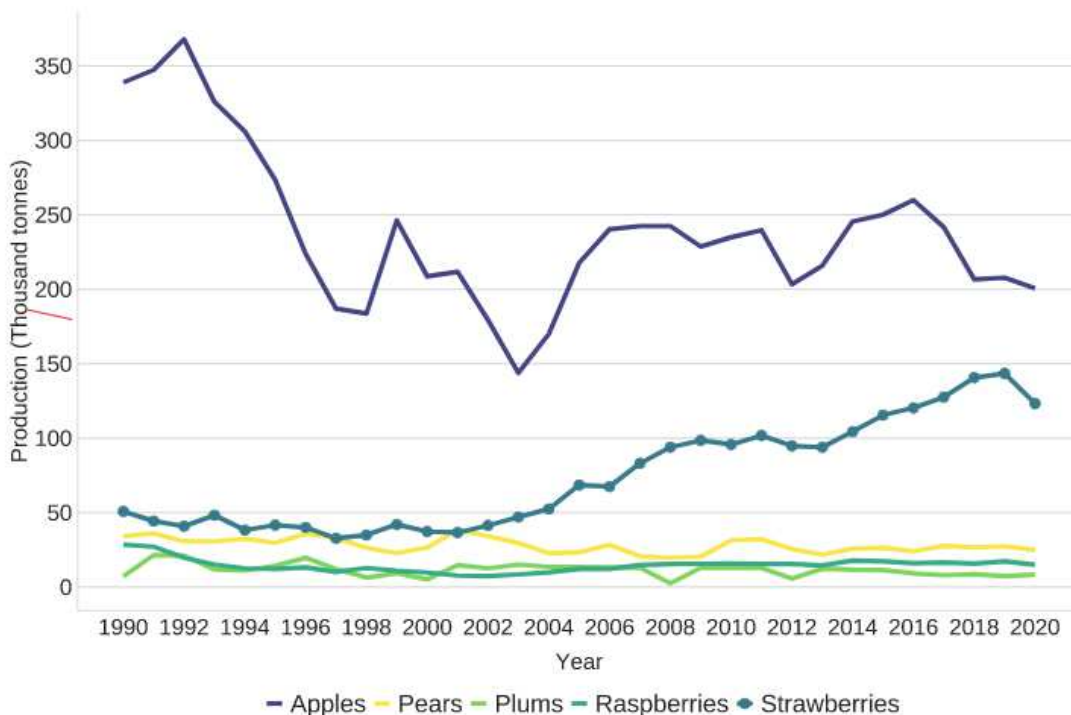
- cereals;
- carrots, turnips, swedes, cabbages;
- beef, lamb, poultry meat;
- milk; and
- eggs.

28 We are less than self-sufficient in fresh vegetables, potatoes, sugar, mushrooms, top fruit and soft fruit and pig meat.

29 This does not necessarily reflect a production limitation, however. For example, apple production has fallen not because we cannot grow apples, but due to the economics of production and the ability to import more cheaply from abroad. As noted earlier, orchard areas have fallen from 100,000 to 20,000 ha. The production statistics below for fruit show a near tripling of production in strawberries since 2000, yet self-sufficiency (see Insert 7 above) remains at about 70%. This reflects changes in consumption trends, not a

production inability. Consumers now purchase berry fruits in winter when the UK cannot produce them.

Insert 13: UK Domestic Fruit Production



30 Therefore where the trends show declining self-sufficiency (potatoes, cauliflowers and broccoli, lettuce, tomatoes, pigmeat) it would be wrong to conclude that we cannot produce these products anymore. There are many other factors, with the two most significant being cheaper products being imported resulting in declining UK production, and changing consumer trends such that seasonal products are now mostly forgotten. We purchase lettuce, tomatoes, soft fruit etc all year round, and to meet that consumer demand we must import out of season produce. This shows in the statistics as declining self-sufficiency.

31 This is not a concern shared by Government. The UK Food Security Report identified high levels of self-sufficiency in UK production.

32 In the Government Food Strategy (2022)^{xi} the largely self-sufficiency in wheat, most meats, eggs and some sectors of vegetables was noted, and that this had been broadly stable for 20 years. The strategy set out objectives **"to broadly maintain the current level of food we produce domestically"**.

- 33 We do not have a self-sufficiency concern in respect of calorie production. The complexities of import and export relate to our varied, and changing, diets rather than to any embedded production problems.
- 34 In the UK Food Security Report (2021) it noted that, for example, the mix of grain grown in the UK differs from the grain consumed in the UK. It was noted that grain does not provide a healthy or nutritious diet or meet consumer demand for a varied diet. However the report noted the following:
- “However, from a purely calorific perspective, the (below average) grain yield in 2020 of 19 million tonnes would be sufficient to sustain the population. It is equivalent to 283kg per person, 0.8 kilos per day. A kilo of wheat provides 3,400 calories (and barley slightly more at 3520 calories), making 0.8 kilos of grain over 2,600 calories, compared to recommended calorie intake of 2 to 2500 for adults. From these figures it is easy to demonstrate that, even without accounting for other domestic products like potatoes, vegetables, grass-fed meat and dairy, and fisheries, current UK grain production alone could meet domestic calorie requirements if it was consumed directly by humans in a limited choice scenario”.**
- 35 The report went on to note that whilst grain is generally the most efficient form of production in terms of calories per hectare, it has a significant environmental impact **“due to the lack of biodiversity in conventional grain fields, damage to soil through ploughing, environmental harms caused by fertilisers and pesticides, and the oil use embedded in fertilisers and field operations”.**
- 36 The EA State of the Environment: soil report also notes that **“severe compaction and poor soil condition is also an issue for around 10% to 15% of grassland fields, as a result of overgrazing”.**
- 37 Bare soils, reduced hedgerows and increased field sizes mean that, in England and Wales, an estimated 2.9 million tonnes of topsoil is lost to erosion every year. Erosion regularly exceeds the rate of formation of new soils (which is at about 1 tonne per hectare per year) on many soils, with 40% of arable soils at risk, especially lighter soils on hillslopes and peats in upland areas^{xii}.
- 38 Management of arable fields, including shelter belts, changes to tillage practice (ie practicing minimal soil disturbance), and good tramline practices reduce erosion.

- 39 **“Significant decreases in erosion risk occurred when fields changed from winter cereal use to permanent grassland”**, the EA reported. Management practices in arable land can make a big difference, but the constant vegetation cover of grassland reduces erosion significantly.
- 40 Organic matter in soil acts like a sponge and can hold up to 20 times its weight in water. Most arable soils have lost 40 to 60% of their organic carbon^{xiii}. The British Society of Soil Science record the declining state of soil carbon (soil organic carbon and soil inorganic carbon), and note that the greatest and most rapid soil carbon gains can be achieved through land use change, eg converting arable land to grassland. Sustainable soil management practices are needed for all soils.
- 41 Biodiversity is also in decline. The 2019 State of Nature Report^{xiv} recorded increases and decreases in different species, but overall a decline in the abundance and distribution of the UK’s species since 1970, continuing a trend started hundreds of years earlier.
- 42 The House of Commons Environmental Audit Committee^{xv} recorded this in stark terms. The Summary started as follows: **“the world is witnessing a colossal decline in global biodiversity”**.

Conclusions

- 43 Importation and export of foodstuffs has long been part of the UK food supply chain, and changes in diet and consumer demand coupled with economic factors have changed UK production.
- 44 Levels of self-sufficiency in most staples remains high.
- 45 Self-sufficiency in calories can be achieved from wheat production alone.
- 46 Government and its agencies highlight declining soil health and quality and biodiversity as a more pressing concern. Food security is not a concern.

References

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- ⁱ Food Supply References and Food Security, Defra (6th December 2022)
 - ⁱⁱ Land Use Statistics: England 2022, DLUHC (27 October 2022)
 - ⁱⁱⁱ National Statistics: agricultural land use in England at 1 June 2022, Defra (29 September 2022)
 - ^{iv} TIN 049 Agricultural Land Classification: protecting best and most versatile agricultural land, Natural England (December 2022)
 - ^v Summary of the State of the Environment: Soils, Environment Agency (26 January 2023)
 - ^{vi} State of the Environment: Soils, Environmental Agency (2019)
 - ^{vii} Agriculture: historical statistics, House of Commons library (25th June 2019)
 - ^{viii} Total Income from Farming in the UK 2021, Defra (12 May 2022)
 - ^{ix} United Kingdom Food Security Report 2021: Theme 2, UK Food Supply Services, Defra (22 December 2022)
 - ^x Agriculture: historical statistics, House of Commons library (25th June 2019).
 - ^{xi} Policy Paper: Government Food Strategy, Defra (13th June 2022)
 - ^{xii} EA, *ibid*, page 8.
 - ^{xiii} Science Note: Soil Carbon, BSSS (2021).
 - ^{xiv} The State of Nature 2019, The State of Nature Partnership (2019).
 - ^{xv} House of Commons Environment Audit Committee: Biodiversity in the UK, bloom or bust? First report of session 2021-22 (23 June 2021).