

Food supply

Revision notes · How farming methods raise food production, and the advantages and disadvantages of monocultures and intensive livestock production.

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Food supply **Spec 20.1**

How humans have increased food production **Spec 20.1.1**

The human population keeps growing, so more food is needed. Farmers have increased food production in five main ways.

Ways of increasing food production		
Method	What it does	How it increases production
Agricultural machinery	Tractors, ploughs and combine harvesters do the work of many people	Larger areas of land can be farmed and jobs are done faster and more efficiently
Chemical fertilisers	Add nitrates and other mineral ions to the soil	Replace ions removed by crops, so plants grow bigger and yields improve
Insecticides	Chemicals that kill insect pests	Fewer crops are eaten or damaged, so quality and yield improve
Herbicides	Chemicals that kill weeds	Reduce competition with weeds for light, water and ions
Selective breeding	Choosing parents with the best features to breed from	Crop plants and livestock with higher production, such as more grain or more milk

Selective breeding takes many generations. Each time, the best offspring are chosen and bred together, so the useful feature becomes more common.

Exam tip: Give the reason as well as the method. 'Herbicides kill weeds so there is less competition for light and water' earns more than 'herbicides kill weeds'.

Monocultures and intensive livestock production **Spec 20.1.2, 20.1.3**

Large-scale monocultures

A **monoculture** is the growing of a single crop plant on a large area of land. Often the same crop is grown on the land every year.

Large-scale monocultures of crop plants

Advantages	Disadvantages
Machinery can plant, spray and harvest the whole field in the same way, which is efficient	Only one crop species is grown, so biodiversity is low and hedges and wild habitats may be removed
Large amounts of food produced at lower cost per tonne	A pest or disease that attacks the crop can spread quickly through the whole field
All the plants need the same conditions, so watering, fertiliser and pesticide use can be planned for the whole field	If the same crop is grown every year, the same ions are removed from the soil, so large amounts of fertiliser are needed
The crop variety best suited to the local soil and climate can be grown, giving a high yield	Heavy use of fertilisers and pesticides can pollute nearby water, and pests can become resistant to pesticides

Intensive livestock production

In **intensive livestock production**, large numbers of animals are kept in small spaces, often indoors, with controlled temperature and feed so that they grow quickly.

Intensive livestock production

Advantages	Disadvantages
A lot of meat, milk or eggs is produced from a small area of land	Animals have little space and may suffer stress, which raises animal welfare concerns
Less energy is lost as heat because the animals move little and are kept warm	Disease spreads easily when animals are crowded, so antibiotics may be overused and resistant bacteria can develop
Food is produced at a lower cost, so prices for consumers are lower	Large amounts of waste are produced, which can pollute water
Animals grow quickly and reach market size sooner	Large amounts of feed must be grown elsewhere and brought in

Exam tip: If asked for an advantage and a disadvantage, make sure the two points are different and each is about the method named in the question.

Quick check

1. Name five ways humans have increased food production.
2. What is a monoculture?
3. Give one disadvantage of a monoculture.
4. Give one advantage of intensive livestock production.

Quick check answers

Food supply

1. Machinery, chemical fertilisers, insecticides, herbicides and selective breeding.
2. The growing of a single crop plant on a large area of land.
3. A pest or disease can spread quickly through the crop (or low biodiversity).
4. Lots of food is produced from a small area, at a lower cost.