

GCSE

Agriculture and Land Use

Animal Nutrition
Food production and
Processing

For first teaching from September 2013

For first award in Summer 2015



agri
culture
and
land use

Food production and Processing



Learning Outcomes

- Explain the differences between intensive and extensive farming.
- Assess the advantages and disadvantages of intensive and extensive farming systems, including organic methods



Extensive beef cattle system based on pasture



Intensive beef cattle system based on meals

Key Terms

Intensive farming
Extensive farming
Stocking rates
Organic methods

Information

The terms intensive and extensive farming refer to the systems by which animals and crops are grown and prepared for sale.

Intensive farming is often called 'factory farming'. Intensive methods are used to maximise yields and production of beef, dairy produce, poultry and cereals. Animals are kept in specialised buildings and can remain indoors for their entire lifetime. This permits precise control of their diet, breeding, behaviour and disease management. Examples of such systems include 'barley beef' cattle units, 'battery' cage egg production, farrowing crates in sow breeding units, hydroponic tomato production in controlled atmosphere greenhouses. The animals and crops are often fertilised, fed, watered, cleaned and disease controlled by automatic and semi automatic systems such as liquid feed lines, programmed meal hoppers, milk bacterial count, ad lib water drinkers and irrigation/misting units.

Extensive farming systems are typically managed outdoors, for example with free-range egg production. Animals are free to graze outdoors and are able to move around at will. Extensive systems often occur in upland farms with much lower farm stocking rates per hectare. Sheep and beef farms will have the animals grazing outdoors on pasture and only brought indoors and fed meals during lambing season and calving season or during the part of winter when outdoor conditions are too harsh. Extensive cereal and dairy farms, for example, are often managed to also meet **organic farming** standards.

Intensive farming advantages and disadvantages

The main advantage of intensive farming is its ability to produce vast amounts of food on the same amount of land at a lower unit price for an ever increasing world population. One disadvantage of intensive farming is the increased production of slurry, manure, as well as air, water and visual pollution. Extensive farming returns most of the

animal manure directly, which sustains the grass production and allows a gradual release of nutrients back into the environment which is much more environmentally friendly. However intensive livestock farming requires storage of slurry and manure, which can create disposal difficulties. Nonetheless if cattle slurry is stored safely it can be used to produce energy, for example in anaerobic digestion units which produce green energy. Another disadvantage relates to the welfare of the farm animals - they are unable to behave naturally by roaming and grazing, grouping socially, or displaying maternal instincts. Furthermore when animals are kept in restricted spaces this can often lead to discomfort, lameness and aggressive behaviour.

Extensive farming advantages

A significantly lower labour input is required and systems are selected that are sensitive to the natural environment such as sheep farming on harsh hill farm situations. Animal welfare is perceived to be better since the animals are not kept indoors constantly and so are allowed to behave naturally. For many crop and animal units they have much lower requirements for fertilisers, medicines, pesticides, water and energy. There will also be less damage to the environment and soil, due to overall lower stocking rate and minimal use of artificial chemicals.

Extensive farming disadvantages

Yields of crops and livestock are much lower than in intensive farming systems so there is a much lower yield to hectare ratio and therefore the food produced is of a higher cost and can even sometimes due to its low productivity have a larger carbon footprint than intensive farming. The greater requirement for land area can restrict the use of land for other managed habitats to encourage particular wild species e.g. forestry and meadows.



Organic Farming



Organic farming methods

More extreme forms of extensive systems are described as organic. Organic farming systems are based around techniques such as crop rotation, green manure, compost and biological pest control. Organic farming uses fertilisers and pesticides but excludes or strictly limits the use of manufactured (synthetic) fertilisers, pesticides (which include herbicides, insecticides and fungicides), plant growth regulators such as hormones, livestock antibiotics, food additives and genetically modified organisms. Organic farms are closely regulated and policed by the various organic bodies such as the Soil Association. The underlying principle is to maintain the health of soils, ecosystems and people. The systems are adapted to the local conditions, rather than 'forcing the system' with extra inputs such as fertilisers and herbicides with sometimes adverse effects

Advantages of organic systems

- Produce worth more
- Benefits the environment and biodiversity
- Healthier food production

Disadvantages of organic systems

- Requires greater area of land
- Lower yields
- Time required to convert land to an organic system
- More expensive prices may discourage consumers to buy

Disadvantages

- Food produced organically tends to be more expensive as the yield is lower than intensively produced food
- Less productivity due to crop rotation
- The use of nitrogen fixing plants instead of fertilisers reduces the area available for growing crops if part of crop rotation
- The use of manure instead of fertiliser is difficult to apply and the mineral content can not be as easily controlled.



Learning Activities

1. In class, do a research exercise to investigate how each farm could be made more intensive or extensive respectively.
2. Create a poster illustrating the advantages and disadvantages of one selected farm type e.g. pig production.
3. Visit an intensive farm e.g. indoor pig production, and an extensive farm e.g. outdoor sheep farming.



Web Resources/Links

www.s-cool.co.uk/gcse/geography/agriculture/revise-it/farming-types

<http://www.soilassociation.org/whatisorganic> -

www.bbc.c.uk/schools/bbcbitese/science/add_gateway_pre_2011/greenworks/farmingrev3.shtml

