## Food Security & Production

### **Human Population**

Increase in human population has led to concerns for food security and food production.

#### Food Security

The ability of human populations to <u>access food</u> of sufficient <u>quality</u> and <u>quantity</u>.

### **Food Production**

Whilst food production must increase to cope with issues of food insecurity it must also be

- Sustainable
- 2. Not degrade the natural resources

### Crop versus livestock production

More energy produced per unit area

Less energy produced per unit area





Livestock protection

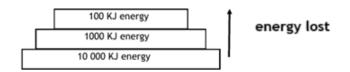
Livestock production should only occur in areas unsuitable for crops.

For example sheep on a steep hill.



### Why do crops contain more energy per unit area?

Crops (producers) are at the first trophic level whereas livestock are at higher trophic levels & energy is lost at each trophic level.



# Types of Farming

## Types of Farming

Feature	Intensive Farming	Free Range farming (organic)
Land Required	<u>Less</u> land required	More land required
Labour intensive	<u>Less</u> labour intense	<u>More</u> labour intense
Price of product	<u>Lower</u> price	<u>Higher</u> price
Cost effectiveness of process	More cost effective	<u>Less</u> cost effective
Net profit	<u>Higher</u> profit	<u>Lower</u> profit
Ethical practice	<u>Less</u> ethical	<u>More</u> ethical
Animal welfare/ quality of life of animals	Low quality of life/welfare	<u>Better q</u> uality of life/ welfare

## Poor Animal Welfare

4 behavioural indicators that can show poor animal welfare during intensive farming.

Indicator	Example	
Stereotype behaviour	Repeated pointless behaviour	
Misdirected behaviour	Inappropriate behaviour	
Altered levels of activity	Apathy—low levels Hysteria—High levels	
Failure in sexual/parental behaviour	Failure to reproduce Rejecting young	

### Factors affecting agricultural production

### Examples of plant crops

- 1. Cereals
- Potatoes
- Legumes
- 4. Roots





There are 2 main factors which can affect agriculture production

- 1. Plant growth
- Breeding of higher yielding cultivars (plant varieties)
- 2. Use of fertilisers
- Protecting crops from pests, disease and competition.
- · Chemical control methods
- Biological control methods
- Cultural methods
- Integrated Pest management
- GM crops

2. Factors affecting photosynthesis

All food production is ultimately dependent on photosynthesis

- Temperature
   Enzymes needed at each stage of Carbon fixation
- Carbon dioxide concentration
   more RuBP converted to 3PG
- Light intensity
   Needed to produce H and ATP for
   3PG to go to G3P

Explain why higher light intensity increases yield of crop.

2 marks

More light

More photosynthesis

More glucose produced for growth

Explain why insect infestation of leaves decreases yield of crop.

2 marks

Less leaves (eaten by insects)

Less photosynthesis

Less glucose produced for growth