

Solutions

2.1 Producers; primary consumers; secondary consumers; tertiary consumers.

2.2 $40 \div 500 \times 100 = 8 \%$.

2.3 Fusarium.

3.1 Only about 10 % of the biomass of each level is transferred to the next; biomass is lost in faeces – not all ingested material is absorbed; and in waste – carbon dioxide and water from respiration, water and urea in urine; so after four or five levels too little biomass remains to support another breeding population.

3.2 Limiting movement reduces energy transferred to the environment as movement/muscle work; so more of the food's energy becomes biomass – meat or milk; controlling the shed temperature means the animals do not burn food to keep warm. Objection – restricted movement and confinement are considered cruel / unnatural welfare conditions.

3.3 Larger mesh (net size) lets young fish escape, so they can grow and breed before capture; quotas limit the total catch per species, leaving enough adults to breed; together they maintain stocks at a level where breeding continues. Biotechnology – the fungus Fusarium is grown on glucose syrup in aerobic conditions to produce mycoprotein, a protein-rich food; GM crops such as golden rice give more food or better nutrition; GM bacteria make insulin, though that treats disease rather than hunger – accept any described solution with its mechanism.