Managing fish-farming systems

Student activity • observation and reasoning

YEAR 11 / LESSON 108 / BIOLOGY ONLY

The question

How can a farm maintain fish production without ignoring health and water quality?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Fish-farm diagram and management scenario cards

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Biology only: 5.9B. Aquaculture methods.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

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1. Map inputs, fish biomass, uneaten feed, dissolved wastes and outputs in a fictional farm.

2. Explain the need to monitor dissolved oxygen, temperature, pH and nitrogenous wastes using species-appropriate limits.

3. Compare feeding quality and frequency with uneaten-feed waste and oxygen demand.

4. Distinguish predation within the same species from predation between species and consider appropriate management.

5. Explain disease prevention, welfare, stocking density and selective breeding without prescribing routine antibiotic use.

6. Evaluate production, waste treatment, escape risks and environmental effects as linked management decisions.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Water-quality requirements depend on species, life stage and system; no universal numerical threshold is supplied. Feeding and waste affect oxygen demand. This is a management case study, not an instruction to maintain live fish in classroom conditions. Fictional case: after feed is increased, uneaten feed accumulates and oxygen readings fall. Pupils propose measurements and management checks; species and life stage are unspecified, so no numerical safe limits or treatment doses can be inferred.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Why monitor dissolved oxygen?

2. How can excess feed harm water quality?

3. What is intraspecific predation?

4. What is interspecific predation?

5. Why consider stocking density?

6. Does selective breeding remove the need for good management?