

Guidance on Multiple Choice Question Writing for the ECVPH

This document is designed to support diplomates across the European College of Veterinary Public Health (ECVPH) in improving the quality of the multiple-choice questions (MCQs) used for the ECVPH qualifying examinations. It provides an overview of the one-best-answer MCQ format that will be adopted, including core writing principles, and common pitfalls to avoid. This guidance is adapted from [“The National Board of Medical Examiners \(NBME\) Item-Writing Guide, 2021”](#).

MCQ format

Multiple-choice questions can be divided into two families:

- One-best-answer questions: require examinees to indicate a single, most accurate response.
- True-false questions: require examinees to indicate all responses that are appropriate.

Unlike true-false questions, one-best-answer questions reduce examinee confusion by avoiding guesswork about the author’s intent. They are also easier and more efficient to write since distractors do not need to be completely incorrect. For these reasons, **ECVPH exams use only one-best-answer questions**, and this guidance focusses on that format.

One-best-answer question format

They consist of a **stem**, which most often includes a **context or vignette** (e.g., a clinical case presentation) and a **lead-in question**, followed by a list of **four options**, with one correct answer and three distractors. Images can also be incorporated into the stem to require examinees to interpret visual information and apply their knowledge in context.

Sample Stem (Vignette & Lead-In) with Option Set

VIGNETTE: “There is a sudden onset of haemorrhagic fever with high mortality in a pig farm...”

LEAD-IN: Two styles can be used for the actual question:

1. Asking for the single best answer i.e., when more than one option is a possibility / could be correct, but one is the best option e.g. “What is the most likely diagnosis?”
2. Asking for the correct answer e.g., “What is the causative agent of African swine fever?”

OPTION SET

- A. African swine fever (Correct answer).
- B. Aujeszky’s disease (Distractor 1).
- C. Classical swine fever (Distractor 2).
- D. Foot-and-mouth disease (Distractor 3).

Basic rules for writing one-best-answer questions

1. Each question should **focus** on an important concept or testing point.
2. Whenever appropriate, questions should assess **application of knowledge**, not recall of an isolated fact.
3. The **question lead-in** should be focused, closed, and clear; in most cases the examinee should be able to cover the options and guess the correct answer based on the vignette and lead-in alone (“cover-the-options” rule).
4. All options should be **homogeneous and plausible** to avoid cueing to the correct option.
5. Each question should be reviewed to **identify and remove technical flaws** that add complexity or cue the correct answer (see below for details).

Identify and remove technical flaws

The quality of a MCQ can be impacted negatively by the inclusion of technical question flaws. Please find below examples of the two kinds of technical flaws to avoid.

Flaws that add irrelevant difficulty to the question

1. **Avoid overly long or complicated answer options.** Keep answers concise and focused.
2. **Avoid inconsistent use of numeric data.** Present all numeric options in a uniform format (e.g., all as percentages or $\mu\text{g}/\text{kg}$), and list them in logical numerical order. Mixing units or formats (e.g., decimals vs. percentages) increases cognitive load without improving question quality.

✗ Poor Example:

What is the maximum permissible level of aflatoxin B1 in complete feed for dairy cattle under EU regulations?

- A. 0.005 mg/kg (*Correct*)
- B. 20 ppb
- C. 0.01 ppm
- D. 15 $\mu\text{g}/\text{kg}$

✓ Improved Example:

What is the maximum permissible level of aflatoxin B1 in complete feed for dairy cattle under EU regulations?

- A. 5 $\mu\text{g}/\text{kg}$ (*Correct*)
- B. 10 $\mu\text{g}/\text{kg}$
- C. 15 $\mu\text{g}/\text{kg}$
- D. 20 $\mu\text{g}/\text{kg}$

-> All values are in the same unit ($\mu\text{g}/\text{kg}$) and logically ordered numerically.

3. **Avoid vague frequency terms** like “often”, “rarely”, or “usually” in options; they introduce ambiguity.
4. **Avoid using “None of the above”;** replace it with a specific, plausible distractor.
5. **Avoid nonparallel options.** Ensure all options follow a consistent grammatical or structural form as test-takers may be confused or misled by irrelevant features.

✗ Poor Example:

What is the most common route of Brucella transmission to humans in endemic regions?

- A. Inhalation of aerosols
- B. Consuming raw dairy products (*Correct*)
- C. Handling infected tissues
- D. It is zoonotic

✓ Improved Example:

What is the most common route of Brucella transmission to humans in endemic regions?

- A. Inhalation of aerosols
- B. Consumption of unpasteurised dairy products (*Correct*)
- C. Direct contact with infected animal tissues
- D. Accidental inoculation via skin abrasions

-> All options are parallel in structure: each is a plausible route of transmission described as a noun phrase

6. **Avoid unnecessarily complex stems.** Focus on what is essential to answering the question or to make distractors attractive. Overly complex or ambiguous stems make the question harder to understand, not because of content difficulty, but due to poor construction.

 Poor Example:

Given that antimicrobial resistance is a multifactorial issue involving human, animal, and environmental health and has implications for food safety, which of the following statements, based on integrated One Health strategies that consider national and supranational action plans, best describes...

 Improved Example:

What is the most important rationale for using a One Health approach in combating antimicrobial resistance?

-> The revised stem is clear, focused, and directly connected to the question's purpose.

7. **Avoid negatively phrased questions** (e.g., "Each of the following statements is correct EXCEPT" or "Which of the following statements is NOT TRUE").

Flaws that cue the test-wise examinee and aid them in guessing the right answer

1. **Avoid grammatical cues.** Ensure all options match the grammar of the lead-in question (e.g., make all options singular or all options plural).
2. **Avoid logical cues.** Prevent answer sets from being collectively exhaustive (i.e., covering all possible outcomes). This can make it easier for test-wise candidates to identify the correct answer by elimination.

 Poor Example:

Which of the following is a possible result of Salmonella infection in poultry?

- A. Death
- B. Recovery
- C. Chronic shedding
- D. None of the above

 Improved Example:

What is the most likely clinical outcome of a Salmonella infection in subclinically infected adult poultry?

- A. Mortality within 24 hours
- B. Rapid onset of neurological signs
- C. Chronic intestinal colonisation (*Correct*)
- D. Acute respiratory failure

3. **Avoid absolute terms** like "always" or "never" in options; they are rarely correct.
4. **Avoid a correct answer option that stands out** (i.e., it is longer, more specific or more complete than other options). All answer options should be of similar length.

5. **Avoid repeating key terms** from the stem in the correct answer.
6. **Beware convergence strategies.** The correct answer should not be the one that contains the most elements shared with other options.

 Poor Example:

What is a typical measure for preventing foodborne illness in dairy production?

- A. Heat treatment
- B. Heat treatment and hygiene
- C. Heat treatment, hygiene, and proper storage (*Correct*)
- D. Hygiene

 Improved Example:

What is the single most effective method for eliminating pathogenic bacteria in raw milk?

- A. Filtration
- B. Pasteurisation (*Correct*)
- C. Refrigeration
- D. Ultraviolet exposure