

TROUBLESHOOTING FERTILITY PROBLEMS

Tom management, semen handling, the insemination crew, hen management and egg handling all contribute to a successful breeding program. Inadequate performance in any of these areas can result in a fertility problem.

In general, sudden drops in fertility can usually be credited to one or two factors. Ongoing, inconsistent fertility issues, however, often have several related causes, which by themselves may not cause a problem, but together result in lower fertility.

This bulletin is meant to be used as a starting point for solving a fertility problem. It is divided into five areas: tom management, semen handling, insemination technique, hen management and egg handling. By carefully evaluating and answering each question, the reader will be directed to areas in his or her program which may require further attention.

Tom Management:

Poor tom management often results in poor semen quality. When investigating tom management, some of the areas to check are:

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| 1. Have the body weights been controlled to maintain a continual weight gain according to the strain's performance objectives? | Yes No |
| 2. Were the body weights at or above the recommended growth curve? | Yes No |
| 3. Has feed and water quality and quantity been good? | Yes No |
| 4. Are the toms active? Are they strutting and gobbling? Are they fully mature and is sexual development uniform? <i>(If the answer to any question is NO, answer NO for question 4.)</i> | Yes No |
| 5. Are there any light toms in the flock? | Yes No |
| 6. Are there immature toms in the flock? Immature toms are characterized by a lack of coloring in the caruncles or wattle. | Yes No |

7. Are more than 20% of the toms molting?
8. Were the toms exposed to a decrease in light duration or intensity after lighting?
9. Is the barn lighting uniform?
10. When the lights are off, is there any light leaking into the barn?
11. Are there any toms producing poor quality semen, e.g. yellow, or thin.
12. Semen quality test: *(If the answer to any question below is NO, answer NO for question 12.)*
 - a. Is the percentage live normal cells of all samples above 60%?
 - b. Is the motility of all samples above 3.5?
 - c. Is the concentration of neat semen above a Pack Cell Volume of 20 for all samples?
 - d. Is the semen volume per tom good, above 0.4 cc/tom?
13. 7 day egg breakout test: *(If the answer to any question below is NO, answer NO for question 13.)*
 - a. Is the true infertile less than 3%?
 - b. Is the preblood deads less than 3%?
 - c. Are the dead embryos less than 4%?
14. Is the barn dusty?
15. Are there drafts or cold spots in the barn?
16. Are the temperatures at floor level below 55°F (13°C)?
17. Is the health of the toms good and mortality low?

- | | |
|------------|-----------|
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |
| Yes | No |

Responses in the highlighted boxes indicate potential problems that should be examined further.

Semen Handling

From the time the semen is collected from the tom to when it is inseminated in the hen, poor semen handling can damage the semen and cause the sperm cells to lose their fertilizing capacity. Some areas to check are:

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| 1. Is good quality semen being collected? The semen should be thick, viscous and white. Mixing thin semen, yellow semen, or semen contaminated with urates, feces, blood, lymph, or urine can reduce the fertilizing ability of a semen sample. | Yes No |
| 2. Are sufficient sperm cells being inseminated? | Yes No |
| 3. Is the semen tube filler giving the same size dose all the time? | Yes No |
| 4. Is the time when the first tom is milked to when the last hen is inseminated from a given vial of semen over 30 minutes? | Yes No |
| 5. If the semen is held for more than 30 minutes, is it cooled and agitated according to recommendations? | Yes No |
| 6. If extender is used, is the semen and extender approximately the same temperature and are they well mixed? | Yes No |
| 7. Is the extender developed for turkey semen storage? | Yes No |
| 8. Is the semen being handled roughly, shaken vigorously, or transferred to different containers many times? | Yes No |
| 9. Is the semen held at temperatures below 37°F (3°C) or above 70°F (21°C)? If on a stud farm, is the semen held below 35°F (2 ^o) or above 41°F (5°C)? | Yes No |
| 10. When multiple Pack Cell Volume readings are taken from the same vial, do they all have the same value? Are the readings from all the vials fairly close? | Yes No |
| 11. Has semen extender been stored to manufacturer’s recommendations? | Yes No |

Responses in the highlighted boxes indicate potential problems that should be examined further.

Insemination Technique

Insemination technique can be difficult to evaluate. According to the literature (Lake, et al.) insemination is best achieved by everting the hen and gently probing into the vagina along the horizontal axis until a very slight resistance is felt, due to a flexure in the vagina. The insemination straw should then be given a slight clockwise circular movement at which it will generally enter further to a depth of approximately 2 inches (5 cm) without meeting any resistance. The semen is expelled simultaneously with the oviduct being allowed to revert to its normal position by releasing pressure on the hen.

The inseminator should make three checks during the insemination of each hen:

Check 1 - Before Insemination - Ensure:

1. The insemination tube is properly filled.
2. The hen is properly everted.
3. The entrance to the oviduct is clearly visible.

Check 2 - During Insemination - Ensure:

1. The hen is inseminated correctly.
2. The semen is expelled at the right time.

Check 3 - After Insemination - Ensure:

1. The oviduct returns to its original position.
2. The semen is expelled from the insemination tube.
3. No semen comes out of the oviduct and there is no semen on the outside of the insemination tube or on the vent area.

Below are some additional areas to evaluate:

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| 1. Are small doses or poor quality semen being inseminated? | Yes No |
| 2. Was the first insemination done prior to first egg? | Yes No |
| 3. Were all the hens inseminated on the first insemination? If not, were the non-inseminated hens separated from the rest of the flock and inseminated later? | Yes No |
| 4. Were the first three inseminations done in seven days? | Yes No |
| 5. Were the toms rested for two full days between semen collections? For example, if semen was collected on Monday, the toms could be used again on Thursday. | Yes No |
| 6. Was the semen dose (sperm number) increased as the hens aged? | Yes No |

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| 7. Is the insemination process finished before the beginning of peak egg production? | Yes No |
| 8. Is there good communication/ coordination between the semen collector and inseminator? | Yes No |
| 9. Is the insemination crew inseminating more than 500 hens per hour? | Yes No |
| 10. Is insemination equipment being cleaned with a detergent or disinfectant that may leave a residue harmful to semen? | Yes No |
| 11. Are hens inseminated with the recommended cell numbers? | Yes No |

Responses in the highlighted boxes indicate potential problems that should be examined further.

Hen Management:

Direct assessment of a hen’s capacity to be fertile is difficult under most breeder farm conditions; however, since ovary and oviduct functions are inter-related, if egg production is good and cull egg production is low, in general we can assume the hen’s capacity to produce fertile eggs is good. Some areas to investigate are:

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| 1. Is egg production at or near the standard level for your operation? | Yes No |
| 2. Is cull egg production at or near standard level for your operation? | Yes No |
| 3. Is the health of the hen good and mortality low? | Yes No |
| 4. Is the hen’s feathering smooth? | Yes No |
| 5. Are there scratches or tears on the backs or hips of the hens? | Yes No |
| 6. Are the barns dusty? | Yes No |
| 7. Are there drafts or cold spots in the barn? | Yes No |
| 8. Is the feed presentation and formulation good? | Yes No |
| 9. Is the water supply adequate and of good quality? | Yes No |

Responses in the highlighted boxes indicate potential problems that should be examined further.

Egg Handling

Temperature changes, cracks and contamination – which occur during egg collection, egg sanitation and egg storage – can influence fertility. When investigating egg handling some of the areas to check are:

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| 1. Are nest boxes clean? Are belts and collection boxes clean on mechanical nests? | Yes No |
| 2. Are the eggs clean when collected from the nest? | Yes No |
| 3. Are the eggs being collected and sanitized on an hourly schedule? | Yes No |
| 4. Are the eggs exposed to fluctuating temperatures? | Yes No |
| 5. Is “egg sweating” occurring at any time? | Yes No |
| 6. Are the egg sanitizer temperature and chemical concentrations correct? | Yes No |
| 7. Is the egg storage temperature and humidity in the recommended range? | Yes No |
| 8. Are the eggs treated with other chemicals during processing, storage or incubation that may react with chemicals previously applied to the egg? | Yes No |

Responses in the highlighted boxes indicate potential problems that should be examined further.

Summary

This troubleshooting guide can serve as a starting point for resolving fertility issues by indicating which areas need to be investigated in more detail. In addition, it can be a useful tool for the flock supervisor or insemination supervisor to use as a check-off list when making routine flock checks to help prevent future fertility problems.

More detailed information concerning fertility in areas of tom management, semen handling, insemination technique, hen management and egg handling can be found in the *Nicholas Management Essentials for Breeder Turkeys*.

References

Lake, P.E., Stewart, J.M.; *Artificial Insemination In Poultry*, Ministry of Agriculture, Fisheries and Food, Bulletin 213, Her Majesty’s Stationary Office London, 1978

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