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## TROUBLESHOOTING FLOCK FERTILITY PROBLEMS

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According to a recent Agri Stats' survey, the average hatchability in the U.S. is around 83%, with a few operations obtaining 85-86%, while others only 79-80%. This difference in results can be explained in part by problems with egg handling and hatchery management. The main reason is often inadequate flock fertility. There are a variety of possible causes for this, such as improper mating ratios and male body weight control.

The purpose of this technical bulletin is to provide a checklist to use when troubleshooting flock fertility problems. It is divided into four hatchability sections — early, peak, mid-lay, and late period. The fertility and hatchability goals at certain ages are shown in Table 1 and suggested mating ratios can be found below. *Note: Refer to the Hubbard Breeder Management Guide for the suggested male body weight goals and general male management.*

<b>EARLY HATCHES — 26-28 WEEKS</b>
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- 1) **Insufficient number of active males.** Four to five active males per 100 females at beginning of mating period are recommended.
  - A) Physiological Castration — Some normal appearing males at housing may have been “physiologically castrated” temporarily (or permanently) due to a very stressful event. Some possible causes are:
    - (1) Some individual males weigh below the critical “threshold” weight of 1.0 lbs. (455 gms) at 4 weeks of age.
    - (2) Erratic body weight development (zigzag), especially in the early- and mid-growing period.
    - (3) Intestinal disease/toxins and subsequent negative effect on body weight development.
    - (4) Severe heat stress in late growing period (or shortly after housing).
  - B) Rough appearing and/or non-uniform males at housing. Flock may have an excess of culls, “crow-heads”, and small males. Some males may be permanently damaged. Some possible causes are:
    - (1) Average male body weights were below the suggested body weight goals for a prolonged period prior to housing.
    - (2) Insufficient floor and/or feeder space. This often occurs when grown with pullets at a high density — less than 1.5 ft<sup>2</sup>/bird (more than 7 birds/m<sup>2</sup>).
    - (3) Disease or leg problems.
- 2) **Male Aggression.** Frightened females will remain on the slats or hide in the nests, resulting in reduced mating activity. No more than 4-5 active males per 100 females are recommended at the beginning of mating period. Some possible causes are:
  - A) Excessive male ratio at housing.

- B) Average male weight in excess of suggested body weight goals at housing and continues to increase rapidly due to combination of overfeeding in male feeders and “stealing” from female feeders. This results in too many active males for the first few hens laying the first eggs. *Note: to reduce stealing feed, it is suggested to (a) not dub the males, and (b) use a female feeder grill opening that measures 2-1/4” high by 1-3/4” wide (57 mm x 44 mm) or 2-1/2” high by 1-11/16” wide (64 mm x 43 mm).*
  - C) The male average weight is about normal at housing, but allowed to increase rapidly due to the same conditions mentioned above – with the same results.
  - D) Shortly after housing part of the males are not able to consume enough feed to maintain a “reasonable” weight gain and become very agitated. This occurs infrequently. Possible causes can be insufficient feeding of males with Noz-Bonz™ and/or insufficient water availability – usually with Plasson® drinkers.
- 3) **Eggs set before flock is 25 – 25-1/2 weeks old.** Expected range of hatchability for eggs set between 24-25 weeks of flock age may be only 65-73% with a fertility range of 83-88% – when there are no other complicating factors.

### PEAK HATCHABILITY

Some possible causes for reduced fertility during this period are:

- 1) **Insufficient Active Males or Male Aggression** - The effects of either problem that occurred during the early mating period will generally (but not always) carry through the peak hatchability period.
- 2) **Reduced Male Feed Consumption** – This causes some males to “cull out” while other normal looking males stop semen production due to body weight loss. This can occur when no adjustment has been made in feed allotment for the males when they can no longer “steal” from the female feeders. The average male body weight may actually increase somewhat afterwards due to no energy being spent on sexual activity by these non-productive males – and, thus, goes toward growth.
- 3) **Insufficient Water Consumption** - This can especially occur with males fitted with Noz-Bonz™ and having to share Plasson® drinkers with females on the slats. *Note: it is a good standard practice, in any case, to have a watering system in the litter area for the males.*
- 4) **Disease or Leg Problems.**
- 5) **Crowding** (floor space) - High bird density in the hen house can affect male mating activity – as well as egg production. A minimum of 1.80 ft<sup>2</sup>/hen (no more than 6 hens/m<sup>2</sup>) is suggested in slat floor houses.
- 6) **Male Feeder Space** – Decreased hatch sometimes noticed with 12-13 males per pan feeder versus recommended 9-10 males. Some males may not be able to consume sufficient feed, especially later on with more “timid” spike males.

### MID-LAY HATCHABILITY (40-50 WEEKS)

- 1) Reduced Male Feed Consumption.
- 2) Insufficient Water Consumption.
- 3) Disease or Leg Problems.
- 4) Crowding (floor space).
- 5) Male Feeder Space.

*Note: the causes for the above five categories can be reviewed under "Peak Hatchability"*

- 6) Insufficient Active Males - Usually need to "spike" with 2-3% younger males (2-3 males per 100 females) to achieve 8-1/2 – 9-1/2% total males in the flock. Possible causes of insufficient males during this period are:
  - A) Overweight males – reduced mating ability.
  - B) Bad feet/legs - often weight related.
  - C) Ratio reduction - due to male mortality and normal culling.
- 7) Male Aggression - See previous suggested causes. The aggressive behavior is often established during the early mating period. One can usually find frightened hens, many with cut backs and flanks, remaining on the slats or hiding in the nests.
- 8) Excessive Feather Loss - Hens with tender backs avoid the males by staying on the slats or hiding in nests. This can be caused by a combination of factors such as low feed consumption, borderline or low energy and/or protein (amino acids) in the diet, cold weather (increased energy requirements), etc.
- 9) Hot Weather – Both fertility and egg production can suffer.

### LATE PERIOD HATCHABILITY (50-65 WEEKS)

Due to age-related reduced mating activity, semen quantity and quality, etc. a minimum of 9 – 9-1/2% total males should be maintained to have 7-8% active males during this final mating period. Some possible causes of reduced fertility are:

- 1) Generally the same causes mentioned during the 40-50 week period carry through this period.
- 2) Overweight Hens – Female effect in fertility. This can especially be a problem in hot/humid weather.
- 3) Overweight Males – Although mentioned in previous sections, this cannot be over emphasized. The average male weight should not exceed 10 lbs. (4.54 kg) – 9.71 lbs. to 9.81 lbs. (4.40 to 4.45 kg) is better! Individual males weighing more than 11-1/2 lbs. (5.2 kg) will probably not be active at this age.

Table 1

HATCHABILITY AND FERTILITY GOALS (Weekly Average)					
Age (wks)	% Hatch	% Fertility	Age (wks)	% Hatch	% Fertility
26	77	90	40	90	98
27	79	91	45	88	97
28	81	93	50	86	96
32	88	97	60	82	93
35	91	98	65	80	92

**SUGGESTED MATING RATIOS**

- 1) As the average male body weight increases, more individual males will reach the sexual maturity threshold weight level, approximately +/-7.0 lbs.
- 2) At housing, mate 8-1/2 – 9-1/2% total males (8-1/2 – 9-1/2 males per 100 females.)
- 3) Provided that the average male body weight conforms to the male body weight goals, the suggested mating ratio should provide 4-5 active males per 100 females by 23-24 weeks of age. *Note: any more than this in the beginning can create male aggression.*
- 4) The 8-1/2 – 9-1/2% total males should provide the recommended level of at least 7-8 active males per 100 females by 28 weeks of age.
- 5) Continue to maintain 7-8 active males throughout the remainder of the production period. This may require 9 - 9-1/2% total males after 50 weeks of age for optimum tail-end hatches.
- 6) Avoid having more than 10% males at any time to avoid possible mating interference.

**NOTES:**

- 1) *Sometimes high early dead embryo mortality can be misinterpreted as low fertility.*
- 2) *Generally, lower fertility is correlated with actual increased early-dead embryo mortality – weak germ.*



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