

Semen Quality



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Figure 1 Good Quality

Artificial insemination is the sole means of breeding today's turkey breeder hen to control disease and to maintain levels of fertility as high as 95% or more throughout the mainstay of the laying cycle. To be successful it requires trained competent staff and male turkeys producing quality semen. This factsheet will focus on the components of good quality semen, and the impact of poor quality semen (see also Hybrid's info sheet "Handling of Male Turkeys for Collection of Quality Semen").

All males should be handled and tested for visual characteristics of volume, concentration and motility to determine the fertilizing ability of their semen two weeks prior to artificial insemination. A conscientious and observant semen collector can prevent the use of poor quality semen, which will result in reduced fertility and profits.

What is good quality semen? It is semen that is thick and white and has the consistency of cream (see Figure 1). If semen visually looks normal in colour and consistency, you can be relatively sure that sperm concentration and motility of the sperm are satisfactory to ensure high fertility. Semen should not contain blood, fecal material, urates, or thin/watery lymph fluids (Figures 2-5).

All of these contaminants are harmful, and sometimes fatal, to both the spermatozoa and the reproductive tract of the female. Yellowish/off-colored semen should not be used as the semen contains more abnormal shaped sperm cells with limited or no fertilization capacity.

Poor quality semen can be yielded on the point of sexual maturity at the beginning of semen production and/or the end of the breeding season.



Figure 2 Yellow/Off-colour Semen

Dispose of males which produce:

- weak or watery semen**
- off-colored semen (dirty samples from one male will destroy the entire pooled sample) **
- low volumes of semen (less than 0.2cc)

**May be produced during periods of stress. Cull if these conditions persist after 2–3 collections.

Sperm cells have a tendency of clumping together forming tangled masses in dense, neat semen. Semen diluents prevent this clumping by thinning out the concentration as well as increasing the metabolic activity of the spermatozoa and enhancing their motility. From a practical standpoint this reduces the normal number of males required and overall costs. Mixing semen along with extender at the ratio of one part semen to one part extender is most commonly used. Some semen extender should be added to the vial before collecting semen to prevent clumping and drying on the sides of the vial during collection. Refer to Hybrid Info Sheet: Semen Storage and Handling for more information.

On average 1cc of good quality neat semen produces 5–10 billion sperm cells, 85% of which are normal cells with 90% motility. Motility readings can be determined looking at a small drop of semen from each tom under a microscope to determine its fertilization capability.

Semen concentration (sperm count) can be most easily determined with the use of a centrifuge and/or spectrophotometer. Other more advanced equipment is available but not practical for every day use in the field.



Figure 3 Semen with Urates



Figure 4 Semen with Fecal Material



Figure 5 Semen with Blood

Sperm dosage per hen can vary from as little as 200 million cells to 400 plus. Some breeds require more cells than others to achieve expected results. Less than 1% of the semen introduced into the oviduct at the time of insemination will make their way to the sperm storage tubules. Note: To a certain degree increased quantity has sometimes been used to cover up poor insemination technique. This type of practice should always be discouraged from happening and not counted on to achieve expected results.

There are two storage sites for semen once deposited in the vagina of the hen. Most of the semen will immediately swim to the utero-vaginal site, some will continue on to the upper infundibular storage site where they are released when the ovum is ovulated. It has been determined that sperm cells can remain viable in these sperm storage sites in the reproductive tract of the female for as long as 50 days or more. To assure and maintain high levels of fertility, hens should be inseminated three (3) times initially within the first 7-10 days of production and weekly thereafter. It has also been determined that higher fertility has been achieved and maintained when one or more of the first inseminations has been performed before the start of egg production if possible.

If high levels of fertility are not achieved there are a number of areas within the industry, starting with the breeder operation, that will lose money. Next will be the hatchery because incubator space will be occupied with infertile eggs. Finally the commercial producers will suffer having to pay higher prices for the poult to help absorb the cost of infertile hatching eggs.

Expected fertility and profits can only be achieved providing all the biological factors underlying proper collection of good quality semen, proper dilution ratio, holding/storage technique, and insertion into the oviduct of the hen have been performed and understood by a well trained staff.

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The information contained herein is a recommendation only and may differ by geographic region. The intent of this information sheet is to assist in improving turkey production.

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