



AMERICAN
KENNEL CLUB

AKC Breeder

SUMMER 2013

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THE AMERICAN KENNEL CLUB'S QUARTERLY NEWSLETTER FOR BREEDERS

The Whelping Box *Managing the Prospective Mom*

By Carolyn Russell Gold

Responsible breeding involves much preparation beforehand, including careful research and self-education by the breeder as well as ensuring that the bitch is healthy and ready for breeding. The following information on preparing the bitch for breeding is based on interviews with and information drawn from articles provided by Autumn Davidson, DVM, MS, Dipl. ACVIM, VMTH SAC, of the School of Veterinary Medicine at the University of California, Davis. Dr. Davidson kindly responded to the following questions about the bitch's reproductive cycle and managing the prospective dam.

How does a breeder begin breeding management of the female prior to breeding?

The canine estrous cycle consists of four phases: *proestrus*, *estrus*, *diestrus*, and *anestrus*. Proestrus and estrus are commonly called "heat" or "season." During proestrus, the start of the estrous cycle, the female attracts male dogs but is still not receptive to breeding.

What happens next?

The female may become playful or passive as proestrus continues. A blood-tinged vaginal discharge (of uterine origin) is present; the vulva is moderately enlarged and turgid. Cells from vaginal cytology smears change over a period of four to seven days from non-cornified (small "parabasal" cells and small and large "intermediate" cells) to cornified cells ("superficial-intermediate" cells and "anuclear" cells).

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Robert Young ©AKC

Patricia Trotter reminds us that "absence of disease does not always indicate the presence of optimum health."

Trash in the Gene Pool *Could environmental toxins be enabling congenital disease?*

By Patricia Trotter

One of the saddest byproducts of modern times is the compromised environment in which we all live. And dogs—both purebred and mixed-breeds—are not any more immune to it than their masters. Exactly how much impact pesticides, plastics, parasite medications, vaccinations, hormones, and other assorted toxic materials in the environment have on the well-being of our animals is difficult to determine.

Are dogs suffering more diseases termed hereditary

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AKC MISSION STATEMENT

THE AMERICAN KENNEL CLUB IS DEDICATED TO UPHOLDING THE INTEGRITY OF ITS REGISTRY, PROMOTING THE SPORT OF PUREBRED DOGS AND BREEDING FOR TYPE AND FUNCTION. FOUNDED IN 1884, THE AKC AND ITS AFFILIATED ORGANIZATIONS ADVOCATE FOR THE PUREBRED DOG AS A FAMILY COMPANION, ADVANCE CANINE HEALTH AND WELL-BEING, WORK TO PROTECT THE RIGHTS OF ALL DOG OWNERS AND PROMOTE RESPONSIBLE DOG OWNERSHIP.

AKC Breeder articles are selected for their general interest and entertainment value. Authors' views do not necessarily represent the policies of The American Kennel Club, nor does their publication constitute an endorsement by the AKC.

“TRASH IN THE GENE POOL” continued from previous page

today than ever before due to a more dangerous environment? My half-century of breeding, studying, investigating, and trying my best to remain open-minded have long led me to consider this possibility.

Is genetic trash in the gene pool more frequently expressed today than in the past? If so, why?

Fingers are pointed at us by those who would like to eliminate the hobby breeding of purebreds because they mistakenly think our breeding practices are at fault. Such thinking is too simplistic, as well as the biased message of hate mongers.

At a time when parent clubs and individual breeders are working harder than ever to remove genetic diseases from the gene pool, we are increasingly accused of negligence in this area.

But what if a large percentage of our collective problems have as much to do with conditions in the environment enabling the expression of “junk” genes that were always present but held in check by optimum environmental circumstances?

Certainly cancer has been identified as a disease that is multifactorial, with environmental influences part of the package. How much are unavoidable conditions of surroundings, available feeds, and other influences determining whether given individuals are affected by various negative health traits or not?

Although autism, a disabling neural disease that starts in early childhood, is considered a disease with a strong genetic basis, the medical world has accepted that toxic materials in the environment may be contributing causes. Such diseases are sometimes considered rare combinations of genetic variations or even mutations. It is reported that mutations can be environmentally sparked. Most genetic expression is caused by genetic combinations rather than one singular

gene, yet each gene is a small piece of the puzzle that when put together allows a particular trait or condition to be expressed.

In a *Thoroughbred Times* article on gene-expression therapy, Kenneth L. Marcella, DVM, addresses this school of scientific inquiry focusing on laminitis. Laminitis is an inflammatory disease that attacks the feet of horses and renders their feet so painful they are unable to walk. The great Secretariat was humanely euthanized while in otherwise excellent health at 19 because even the world’s best equine veterinarians were unable to help him.

A Holistic Approach

Inflammation is the cause of such diseases as arthritis and fibromyalgia—but it very well could be the cause of most disease. Marcella’s article addresses the potential for science to discover how to isolate and control genetic behavior, switching genes on and off for the good of the order. His report addresses the development of a natural supplement aimed at improving cellular function of the animal, allowing the body to heal itself or even prevent disease. The supplement is a phytoalexin, the defense mechanism used by plants to protect themselves.

Called resveratrol, the supplement utilizes grapes, seeds, and nuts as its source and is the element in red wine thought to provide health benefits to those who drink it in moderation. It would seem that plants are the source of much that is healthy food in our environment. Wolves and other doglike animals go for the partly digested plant contents in the stomachs of the herbivores they kill as soon as they are done with the liver. The liver provides vitamin A and the vitamin B complex, while stomach contents provide various enzymes and plant materials.

In the 1980s, I rescued a 6-year-old





Norwegian Elkhound eaten up with sebaceous cysts that were infected and inhabited by maggots. This dog was near death, depressed, and bone thin. Immediate veterinary attention, coupled with a highly supplemented nutritious diet, resulted in his speedy return to good health and the eventual completion of his championship title. Throughout the years, our feeding schedule has included various supplements to strengthen the immune system and the dogs' overall health. This is especially true when dealing with brood bitches, whose well-being is so essential to the program. Although it cannot be proven, it appears that hip dysplasia and other diseases associated with heredity can

be reduced to some extent by a concentrated holistic approach.

The Takeaway

We live in a world of increasing medical expertise on the one hand, and increasing holistic activity on the other. The medical community expands its ability to treat disease all the time, while the holistic group attempts to prevent it. Obviously, in a perfect world there would be a meeting of the two to increase the well-being of all.

Dedicated, responsible dog breeders must continue to improve the environment of each individual while monitoring hereditary problems to produce the optimum for the animals

in their breeding programs. Raw diets, supplements, and the best of foods produce healthier animals when they are the product of healthy gene pools. Substituting natural products for toxic ones also helps.

Dog breeders must remain constantly alert to the dangers that can compromise the well-being of their animals. Keep in mind that absence of disease does not always indicate the presence of optimum health.

(Originally published in the July 2010 *AKC Gazette*.)

Patricia Trotter is an AKC judge approved for more than 80 breeds and Best in Show. She is the founder of the famed Vin-Melca line of Norwegian Elkhounds.

AKC CHF News Updates

CHF's Golden Era Begins

The AKC Canine Health Foundation and the Golden Retriever Foundation have announced the joint funding of nearly \$1.5 million in canine-cancer research.

The foundations have worked together to select two studies expected to significantly improve the understanding and diagnosis of canine cancer. The grants will primarily focus on Golden Retrievers, but both projects emphasize a better understanding of how cancer begins and spreads. This will result in research applicable across all breeds,

and may have an impact on human medicine as well.

The research teams will commence work later this year, with anticipated completion dates in 2016.

Read about both studies in-depth at akcchf.org.

Tufts Breeding and Genetics Conference

The sixth Tufts Canine and Feline Breeding and Genetics Conference, sponsored by Nestlé Purina PetCare and Illumina, is scheduled for Friday evening, September 27, through Sunday, September 29, at the Omni Parker House in Boston.

Jerold Bell, DVM, a clinical associate professor in the department of Clinical Sciences at the Cummings School of Veterinary Medicine, will be the course director. Open to veterinarians, technicians, researchers, dog and cat breeders, and enthusiasts, the course is 15 hours continuing medical-education credit for the veterinary community.

The registration fee is \$295 for the full conference and \$210 for one day. Registration before September 6 is \$235 for the full conference and \$175 for one day. Registration includes lectures, continental breakfast, lunch, and course notes on a CD.

Register at akcchf.org.





Inside AKC

AKC Honors, Supports Those Who Serve



Since the terror attacks of September 11, 2001, the AKC has been committed to supporting and honoring the nation's volunteer corps of search-and-rescue dogs and handlers.

In the wake of 9/11, the AKC and AKC Companion Animal Recovery created the Canine Support and Relief Fund. This year the fund has awarded \$413,000 in grants, the majority of them to search-and-rescue teams. K-9 rescue volunteers, along with organization that support companion-animal relief during natural and civil disasters, have received a total of \$4 million from the Fund since 2002.

"AKC CAR continues its commitment to supporting the lifesaving work of hundreds of search-and-rescue groups," AKC CAR Chief Executive Officer Tom Sharp says. "Many of these organizations are staffed by K-9 handlers volunteering their time and expertise to help our local communities."

The grants will help teams pay for radios, GPS equipment, and travel to disaster sites; heat-alert systems and temperature-sensor monitors; cooling vests, water-safety vests, and repelling harnesses; and training seminars and certifications.

"We thank these deserving organizations for their dedication and efforts, and are very proud that the Fund leads the charge in providing them with much needed funding," Sharp says.

New SAR Title

The AKC has announced the creation of a title to acknowledge the work of wilderness search-and-rescue dogs. The AKC already acknowledges dogs certified by the Federal Emergency Management Agency or State Urban Search and Rescue as urban search-and-rescue dogs.

The new title, Search and Rescue–Wilderness (SAR-W), acknowledges dogs who use air-scenting or tracking abilities to locate missing persons in a non-urban setting.

Within the field of wilderness search-and-rescue there are dogs who specialize in tracking, trailing, air-scent, and water and avalanche work.

"Search-and-rescue is a valuable, modern-day working activity for our dogs," Vice President of Companion and Performance Events Doug Ljungren says. "At the time of greatest need, when we're looking to find lost or trapped people, human remains, or help others during disasters, SAR dogs and their handlers are there to provide their assistance."

To be eligible for the SAR-W title, a dog must have been deployed on at least five missions, certified by an AKC-recognized organization, and AKC-registered or enrolled in Canine Partners. The handler is required to submit the dog's SAR certification document and documentation verifying the dog's deployments.

Ljungren says, "The AKC is proud to acknowledge skill and service of these dogs by offering the new SAR-W title to add to their AKC record."

SAR Info

For the complete roster of AKC CAR grant recipients, visit akccar.org/givingback/.

To submit an application form for the SAR–W title, visit akc.org and search "SAR title form." If you would like more information or have a question about SAR–W, contact Lisa Carroll (919-816-3900; performanceevents@akc.org).





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For more information visit www.akc.org/canine_legislation
or contact doglaw@akc.org

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Maximizing the Probability of Successful Copulation

Excerpt from Royal Canin Successful Guide to Dog Breeding

IDENTIFYING THE IDEAL TIME FOR THE FEMALE

THE FEMALE'S ESTROUS CYCLE

The estrous (reproductive) cycle in females is mono-estrous (one period of ovulation per cycle) with spontaneous ovulation (ovulation is not triggered by exterior stimulus). It is however possible to observe heat in young females terminating before ovulation, mimicking an ovulation cycle. In that case, fertile heat often returns a few weeks later. This disjointed heat is not regarded as pathological in females unless it occurs in the first two months of life, in which case it is known as false heat.

PRO-ESTRUS

This is the first phase of the reproductive cycle. It lasts for about 10 days, but there are large variations going from 5 to more than 20 days. Estrous is generally announced by swelling of the vulva, heavy congestion of the vagina and vulva lips and, in particular, a bloody discharge through the vulva from the uterus. During pro-estrus the smell of the urine and the secretions (of pheromones) from the uterus and vagina attract males, but the female generally refuses to copulate.

ESTRUS

This is the second phase, during which the female's behavior changes and she starts to become receptive to males. Its duration is also highly variable, 7 days on average, but ranging from 3 to 30 days. Ovulation occurs during this phase.



DIESTRUS (METESTRUS)

For about two months after estrous, regardless of whether they have been mated, hormonal functioning is virtually identical in all females. They refuse the male and secrete large quantities of progesterone. The terms diestrus, metestrus and luteal phase are all used indiscriminately. The term luteal phase refers to the ovarian corpora lutea, the yellow bodies that produce progesterone.

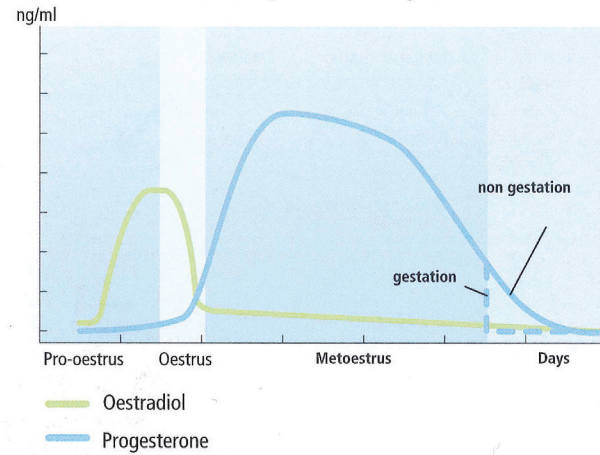
ANESTRUS

After having been in heat, females will remain sexually dormant for at least two to three months, sometimes much longer.

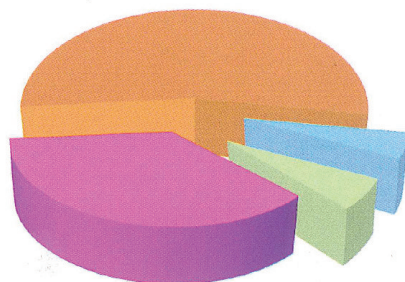
PARTICULAR CHARACTERISTICS OF FEMALES DURING HEAT

Unlike most species, the female's ovaries start to secrete progesterone a few days before ovulation. The progesterone level in the blood gradually increases, regardless of whether the female is pregnant or not. Progesterone is therefore an indicator of ovulation but not of gestation.

Primary secretions in females during the reproductive cycle



The various phases in the female reproductive cycle



Heat

- Pro-oestrus: average = 10 days
- Oestrus: average = 7 days
- Dioestrus: 2 months
- Anoestrus: average = 3 months

DETERMINING THE OVULATION PERIOD

Breeders sometimes wonder whether it is worthwhile monitoring estrous in females to pinpoint the optimal moment for mating. This can actually help the breeder's day-to-day work considerably and improve reproductive success incorrect determination of when to mate is the primary cause of infertility in females.

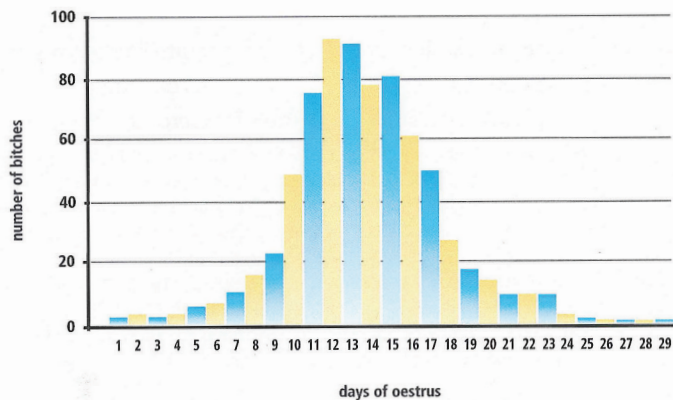


BEHAVIOR AND MORPHOLOGICAL CHANGES

Systematic copulation twelve days after the first blood discharges then two days later is a practical strategy for the breeder. However, while 40% of females are ready for copulation between day 10 and 13 of heat, 10% are ready before this and 50% after. By always mating the females on day 12 of heat without determining more precisely the day of ovulation you risk them not becoming pregnant or having poor litter size.

Lighter losses from the vulva after discharge of blood, is generally a sign of the end of pro-estrus but it is not a reliable sign of ovulation. While the appearance of discharge can help breeders, it is not a precise science. Acceptance of the stud or the heat detector male and the lateral deviation in the carriage of the tail are not very good criteria either. Estrus lasts 7 days on average, but it can last anything between 1 and 15 days, so just because there are no problems during copulation, it does not mean that it is the optimal time for the female. Furthermore, many females allow copulation when they are suffering from urinary infections or ovary pathologies (ovarian cysts). Acceptance of copulation is not enough on its own, due to its unreliability.

The resistance of the vaginal mucosa can also be measured. During pro-estrus, resistance gradually increases before falling in the 48 hours around ovulation. Breeders should be more interested in the curve than the values. The maximum values and the date of decrease vary from one cycle to another - monitoring on a daily basis - even twice a day if it is to be reliable. A progesterone test should also be conducted, although there is a risk of infection when using the ohmmeter tube so hygiene is critical.



When all breeds are taken together, heat occurs every 6 months on average. This interval can vary due to various factors (breed, environment, social contact, medical treatment). The regularity of heat is the important thing. A veterinarian should be consulted immediately if a female's heats occur closer together or less and less frequently.

SOURCE:

Practical Guide To Dog Breeding Pages 220-225 Dominique Grandjean, Sarah Riviere, Philippe Pierson et al.
Fourth Edition 5/25/2010 © Royal Canin SAS



Distribution of dates of ovulation (379 females, studied at Veterinary school in Alfort's reproduction centre).

It can be seen that while 40% of bitches are effectively ready for mating between days 10 and 13 of estrus, 10% were ready before these dates and 50% after.

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“THE WHELPING BOX” continued from page 1

What do these changes in vaginal cytology mean or signal to the breeder?

These changes reflect increasing estrogen from the ovarian follicles. Red blood cells are usually, but not invariably, present. Proestrus can last from three days to three weeks, with nine days the average. Proestrus progresses to estrus.

What happens during estrus?

The normal female displays receptive (or sometimes, passive) behavior, enabling breeding to occur. Vaginal discharge normally *diminishes* at this time, and it may become lighter in color or even be clear. Vulvar edema tends to be maximal and the vulva flaccid to facilitate breeding. Vaginal cytology during estrus consists of 80 to 100 percent cornified cells. Red blood cells tend to diminish but sometimes persist throughout estrus.

How long does estrus normally last?

Estrus can last three days to three weeks, with nine days being the average. Receptive behavior begins when estrogen concentrations decline and progesterone concentrations increase. The duration of receptivity to male dogs is variable and may not coincide precisely with the fertile period, which occurs during estrus.

When does ovulation occur?

Ovulation is triggered by a surge in the luteinizing hormone (LH) produced by the pituitary gland. Ovulation of immature, infertile primary oocytes (eggs) begins approximately two days after the LH surge; oocyte maturation occurs over the following one to three days. The life span of the secondary (fertile) oocytes is two to three days. The female’s *actual fertile period* extends from three through six to seven days after the LH surge. The LH surge occurs at the same time as an initial increase in progesterone concentration, enabling ovulation timing by measurement of either hormone.

How does the breeder time ovulation?

Ovulation timing should be performed using a combination of serial vaginal cytologic exams, ideally serum (blood) progesterone concentrations. Testing for LH can be used in some cases (such as for infertility or frozen-semen breedings).

Start vaginal cytology exams during the first few days of proestrus; perform every two to three days. When more than 70 percent of the epithelial cells are cornified (“superficial” cells), serum progesterone testing should be done every 48 hours to detect the day of initial progesterone rise (usually between 2 to 3 ng/ml), which correlates with the LH surge triggering ovulation. That is called “day zero.” The female is most fertile, and can be bred with good conception rates, between two and seven days after “day zero.” The number of breedings and the optimal day(s) of breeding depends on the



Isabelle Francais ©AKC

type of semen (fresh [e.g., live-cover or trans-cervical insemination], chilled/extended, or frozen).

If LH testing is used to determine the most precise ovulation timing, daily serum samples must be taken once the vaginal cytology contains more than 70 percent “superficial” cells. Initial rise in progesterone or occurrence of the LH surge is confirmed around 48 hours later by running an additional progesterone test. *At the time of breeding, progesterone should be above 5 ng/ml.*

To economize ovulation timing, daily serum samples can be saved (refrigerated or frozen) and selected for later LH testing based on estimated initial rise in progesterone.

Q: How does a breeder manage a “maiden” bitch?

A: Primiparous (maiden) bitches should have a veterinary exam prior to breeding to ascertain general health, and specifically to rule out problems (vaginal strictures and inverted nipples) that could arise during breeding, whelping, or nursing.

A discussion with your vet about the canine estrous cycle, ovulation-timing techniques, and breeding management, as well as guidance in performing screening tests for genetic diseases common to your breed, should take place prior to mating.

A screening test for *Brucella canis* is advised annually for stud dogs and before each breeding for brood bitches. *Brucella* testing should occur even in the maiden bitch, as the infection can be transmitted without breeding.

Vaginal cultures are not necessary for healthy bitches; normal vaginal flora is not harmful to stud dogs nor detrimental to conception.

Also, the vet staff and client need to come to an agreement beforehand concerning the management of *dystocia*, or difficulty in whelping, should it occur.

Q: There are different methods of accomplishing a breeding. What are they?

A: Conception is most likely with a “live cover,” or natural breeding, with “ties.” But artificial insemination (AI) breeding,





using a fertile stud dog and proper timing techniques, can be highly successful. AI is needed when using fresh-chilled or frozen semen, as well as with geriatric or inexperienced stud dogs or aggressive bitches.

AIs are best accomplished using a clean, rigid, mare uterine infusion pipette, allowing placement of semen near the cervical opening in the upper vagina. The successful use of frozen semen requires intrauterine deposition, now possible with rigid endoscopy through the cervix, transcervical insemination (TCI) being an additional tool for experienced vets, reducing the possible need for surgical implantation. Another option when using frozen semen is surgical implantation.

Q: After the bitch is bred, if she is not in whelp, what would a breeder expect to see?

A: Following estrus and breeding, the bitch enters *diestrus*. During diestrus, the normal bitch becomes refractory to breeding, less attractive to males. Vaginal discharges become mucoid and diminished, and vulvar edema slowly resolves. Vaginal cytology is altered by reappearance of noncornified (“parabasal”) epithelial cells and, frequently, white blood cells. Diestrus usually lasts about two months in the absence of pregnancy. Bitches normally experience a false pregnancy if not actually pregnant at the end of diestrus.

Q: What happens after diestrus?

A: After diestrus the bitch enters *anestrus*. The interestrus interval (the period between outwardly apparent heat cycles) consists of diestrus and anestrus and normally varies from four and a half to 10 months in duration, with seven months the average.

Q: What is the anestrus phase?

A: The anestrus phase is characterized physically by apparent reproductive inactivity, although hypothalamic, pituitary, and ovarian hormonal fluctuations are occurring. During anestrus, the uterus is undergoing recovery and repair following a false or true pregnancy. The normal bitch is neither attractive nor receptive to male dogs. Little vaginal discharge is present, and the vulva is relatively small.

Vaginal cytology taken during anestrus finds small “parabasal” cells, with occasional white blood cells and small numbers of mixed bacteria representing normal flora. Anestrus normally lasts from one to six months, before the bitch enters proestrus again and starts another heat cycle. At least two months of anestrus are required for fertility.

Carolyn Russell Gold is the Gordon Setter columnist for the AKC Gazette. This article first appeared in two installments in the Gazette's 2013 April and July issues.



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