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Care and Management of the Pregnant and Lactating Bitch

PRIOR TO BREEDING

Vaccination

All vaccinations should be performed at least two weeks prior to the first breeding. No vaccines should be administered to the breeding or the pregnant bitch. A nomograph can be taken just prior to breeding or up to 45 days of pregnancy to ascertain how a bitch's antibody titer for distemper virus and parvovirus will affect the degradation of absorbed colostral antibodies in the puppies. This is then used to help determine the best vaccination protocol for each litter of puppies. Alternatively, titers can be determined on the puppies themselves if one was not run on the bitch before 45 days of pregnancy. If titers are to be run on the puppies, then they should be performed around 5-6 weeks of age. Titers are recommende again at 24 weeks of age to ascertain for any puppies that have had vaccine response failure.

Health clearances

A general physical examination should be performed to ensure no health concerns exist (ie. heart murmurs, brachycephalic airway disease, lameness). Examination of the reproductive tract is best performed when the bitch is in proestrus/estrus. Depending on the breed, health testing should be performed on both sire and dam based on recommendations by the breed club. This may include such things and hip, elbow and patellar evaluation, thyroid testing for autoantibodies, eye examination (CAER, previously called CERF), cardiac evaluation (auscultation and/or ultrasound), vertebral or tracheal evaluation for brachycephalics, hearing evaluation (BAER), plus many others. All breeds should have genetic testing performed. Some breeds have specific tests which need to be performed by specific laboratories, but most can be tested using one of the newer SNP panels offered by companies like Wisdom, Embark or PawPrint Genetics.

Some health testing has an age requirement (ie. minimum age for testing) and others can be performed at any age.

Bitches over 4 years of age (medium – giant breeds) or 5 years of age (toy-small breeds) should have a basic complete blood count, chemistry screen, urinalysis and urine protein:creatinine ratio or microalbuminuria. If ticks are endemic in the area, tick titers should be run. If heartworms are endemic in the area, then a heartworm test should be run. Brucellosis and Leishmaniasis should be tested on all females prior to breeding in regions where the disease exists. Thyroid testing is not necessary unless it is being used for genetic testing purposes or the bitch has clinical signs of hypothyroidism.

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Deworming

If the bitch hasn't been dewormed within 6 months of breeding, it is recommended to deworm her at the onset of proestrus. Bitches on routine HW prevention, will be dewormed monthly and do not need further deworming. Once confirmed pregnant, bitches should be dewormed with fenbendazole or milbemycin 2 weeks prior to their due dates, 2 – 3 days after whelping (assuming everything is normal with the bitch and the puppies) and again 2 weeks later. This larvicidal deworming will decrease the parasite load transmitted to the fetuses transplacentally and the puppies through the bitch's milk. Puppies should be dewormed with pyrantel pamoate (Strongid®) beginning at 3-4 weeks of age and repeating every 2 weeks until weaning. Additional deworming protocols may be recommended based on kennel situations.

DURING PREGNANCY

Pregnancy diagnosis:

Diagnosis of pregnancy is recommended by mid-pregnancy whenever possible as this allows the breeder to adjust the diet nutritionally based on the number of embryos present and after pregnancy is confirmed to exist.

Ultrasound (u/s) examination for pregnancy can be performed as early as 19 days post-ovulation but only a tiny empty gestational sac is visible at this stage, neither the embryo, nor the embryonic heartbeat are visible. In bitches with a history of conception failure or early resorption, pregnancy should be determined as early as possible. For the bitch with no history of breeding problems, ultrasound examination can be done at day 25-26 post-ovulation, at which time heartbeats will be evident. If an estimate of embryo numbers is desired, then checking the bitch around 25-30 days will give the best estimate of numbers. As the embryos get larger it is harder to count them as it is difficult to know if you are counting the same embryo/fetus twice, but just from a different angle.

In bitches that have not been timed for ovulation, the initial ultrasound examination can be performed 3 – 4 weeks following the last breeding, but failing a positive pregnancy exam, she should be rechecked in 7 – 10 days to ensure that she did not ovulate the week after the last breeding. Bitches with high risk pregnancies may require serial ultrasound examinations. Whelpwise monitoring (tocodynomometry) may also be utilized in high risk pregnancies to help monitor uterine activity that may indicate concerns with the health of the pregnancy and signs of pre-term labor.

Relaxin testing is not as informative as an ultrasound but in areas where u/s is not available, this is a valuable diagnostic test. It may be positive as early as 21 days in

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some bitches but false negative can occur up to 35 – 40 days of pregnancy in some situations. False positives may also occur in litters where pregnancy loss has occurred.

Pregnancy radiographs for fetal counting is best performed during the last week of pregnancy. They can be done anytime after 45 days of pregnancy (days post-ovulation) but they are most accurate within a week from the due date when the fetuses are larger and more mineralized.

Nutrition

Bitches should be switched from a normal maintenance diet to either a puppy food or a performance diet during the 6th week of pregnancy. A quality dog food is desired, preferably with meat rather than vegetable protein as the main ingredient. Protein content should be 30% and fat content 20%. The calicum to phosphorus ratio should be between 1.2:1 and 1:1. A minimum of 350 kcal/cup is required and more than 400 kcal/cup is preferred if litter size is above average, as it will be difficult to feed a bitch enough food in late pregnancy with the expanding size of the uterus and the decreasing space for the stomach in the abdomen. Feeding of dairy products and calcium supplements should be avoided in all breeds during pregnancy and lactation, unless specifically recommended by the veterinarian. Calcium-rich foods and supplements may actually increase the risk of hypocalcemia (low calcium levels) by suppressing the natural mechanisms for rapid calcium mobilization when needed during late pregnancy and lactation.

Raw diets should be avoided from day 30 gestational age (before the placentas form) until 4 weeks post-whelping. Animals fed raw diets sustain small abrasions of the GI mucosa from the bone they eat and all raw diets, no matter how meticulously they are prepared (commercial or homemade) contain potentially pathologic bacteria. Normal healthy dogs can dispose of these bacteria before they leave the gut and enter the bloodstream. Since pregnancy is immune-suppressive, the bacteria found in raw foods may enter the bloodstream and often preferentially go to the placental sites (because of their increased blood suppy) where they may cause infection which may result in fetal death or abortion. This suppression of immunity continues for the first 3 – 4 weeks post-whelping and may increase the risk of metritis.

Bitches not eating balanced diets during pregnancy may experience fetal growth restriction or retardation, poor body condition (too fat or too thin), gestational diabetes or pregnancy toxemia, and inadequate mammary development and/or milk production.

The transition to the new diet should occur over about 10 days. Initially, ¼ new diet and ¾ old diet should be fed for 3-4 days, then ½ and ½ of each, then ¼ old diet and ¾ new diet should be fed. The litter size, breed and body condition of the bitch will dictate exactly how much extra the bitch should be fed. With average sized litters, one should

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increase the amount fed by 1.5x by the time the bitch whelps, and triple the amount fed by 2 weeks post whelping (peak lactation). Maximal amounts of food should be fed for 2 weeks post peak lactation and then the bitch's diet should be tapered back to a normal amount (beginning at the time that food is first beginning to be supplemented to the puppies) and should be back to a normal amount by the time of weaning. She should be transitioned back onto her regular adult dog food over 10 days as well, using the same type of transition schedule as described above. Exact amounts of food should be determined following discussion with the veterinarian after considering litter size and body condition of the bitch.

Many bitches experience inappetence or a syndrome similar to 'morning-sickness' starting about 2 weeks post ovulation and this usually continues through just past mid-pregnancy. Use of an anti-emetic like ondansetron (Zofran®) may be helpful during this period. Maropitant (Cerenia®) should be avoided since it can affect pituitary function. Bitches that were picky eaters prior to pregnancy, often go off their food completely and it may be difficult to get them to eat much during the entire pregnancy, making it very difficult to provide proper nutrition and increasing their risk of developing conditions like pregnancy toxemia, uterine inertia and poor mammary development with inadequate milk production post-whelping. Force feeding may be necessary in these cases.

Supplements:

A mercury-free, xylitol free fish oil should be offered during pregnancy. In human and rodent studies, fish oil has been shown to benefit embryo development. A quality, canine probiotic (ie. Fortiflora®, Proviable®, VisbiomeVet®) should be fed from the onset of the heat cycle until weaning as this may help to repopulate the skin with healthy bacteria which may in turn reduce the risk of mastitis. Folic acid is often added during pregnancy. There is little evidence that this will reduce the risk of cleft palates but it does seem to reduce the risk of dermoid cysts in Rhodesian Ridgebacks. While it is not clear that there is a benefit to supplementing folic acid to any breed other than Rhodesian Ridgebacks, it is a water soluble vitamin and any excess will be excreted in the urine, so it is safe to give, whether there is a benefit or not. Typically either 400 or 800 mcg is recommended, based on the weight of the bitch.

Care should be taken using any other supplements. A reproductive specialist should be consulted prior to the use of any other supplements. Many supplements touted for use in breeding animals are actually contraindicated, so use great care before adding any other supplement without approval of a reproductive specialist.

Exercise

Regular exercise is important for the pregnant bitch. The uterine and abdominal wall musculature are kept in good tone along with the skeletal muscles which will help the bitch during whelping. Walking or running are both acceptable but the bitch should not

be forced to exercise beyond a point where she is fatigued. Typically, the amount of exercise that can be completed will decrease over time with a pregnancy, especially with larger litters. Care should be taken if the bitch normally swims, to ensure she is only in a clean water source (free flowing rivers, oceans or chlorinated pools) so that she is not drinking contaminated water while swimming nor is that contaminated water getting into the vaginal canal and potentially up into the uterus via the cervix. Care should also be taken to not allow the bitch to jump over structures that might hit the abdominal wall because as the pregnancy proceeds the bitch's center of gravity changes and she gains weight, but she doesn't realize these things have happened, thus she will jump as she did prior to pregnancy and thus may not clear the structure she is jumping over or into (ie. car, over a stone wall, etc). Uterine rupture may occur if the abdomen strikes a solid structure with enough force to compress the uterus around a fetus.

Stress:

Stress should be avoided whenever possible. Chronic stress during pregnancy may result in premature luteolysis or loss of progesterone production from the ovaries which is needed to maintain pregnancy. Chronic stress and persistently high cortisol levels can also affect fetal brain development and predispose puppies to be more anxious and reactive as adults.

PREPARING FOR DELIVERY

Temperature monitoring

The bitch's temperature may drop just after her progesterone concentration drops below 2 ng/ml. This drop occurs because progesterone is a 'heat-producing' hormone – it tends to maintain body temperature 1-2 degrees higher than normal. Because progesterone is elevated for the entire pregnancy, when it drops below 2 ng/ml, the temperature center of the brain must reset itself. Before it is able to do this, the bitch's temperature may drop significantly (usually 2-4 degrees Fahrenheit – to 96—98F). The temperature center of the brain resets quickly and the bitch's temperature will rise back to the normal range within 6-8 hours. For this reason, temperature monitoring should be taken 3 times daily beginning 1 week before her due date. Temperatures should be taken at the same time each day with no more than 8 hours between monitoring. A drop in temperature below 98F is indicative of whelping within the next 24 – 36 hours. In some bitches the temperature drop does not reliably occur or may be more subtle and only reach 99°F (small litters of 1 – 2 puppies or in bitches where progesterone has been dropping very slowly rather than a more abrupt drop).

Environment:

The whelping room should be set up at least a week prior to whelping and the bitch allowed to visit the whelping box regularly. It should be in a quiet room in the house or

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kennel, away from other dogs and human and canine activity. It should have a door that can be closed and if there are windows they should have shades on them to prevent anyone or thing from peering inside. In cases of smaller breeds, sometimes a closet will work. The room temperature should be around 70F and 70% humidity. If needed a humidifier or several extra water bowls should be placed in the room for added moisture content to the air. The whelping box can be commercially built or home-made box or a wading pool or dog crate. There should be enough room for the bitch to lay on her side fully stretched out and plenty of room for puppies to spread out while the dam is sprawled out. Generally speaking the whelping box should be at least 1.5 x the bitches length from head to tail in all directions. Some bitches will like to have a cover on the box to make it appear more den-like. This can be created by draping a blanket or towel over the top of upward projecting sticks on all 4 corners. Whelping boxes are best when they have 'pig rails' which is a protrusion from the lower wall of the box that protects the puppies from the bitch laying on them and smothering them against the wall of the box. If a bitch lays down against the pig rail, the protruding edge prevents the hind end from making direct contact with the wall, thus providing a buffer for the puppies to not be crushed between the bitch's hind end and the wall. The height of the pig rail should be the distance from the middle of the bitch's spine to the floor when she is lying on her side.

A heat source in the whelping box should be provided at one end. There should be a temperature gradient from about 85F to 75F from one side of the box to the other. Heat sources may include a heating pad or lamp or whelping nest which has a programmable rheostat to adjust the temperature as puppies increase in age. The bitch should be able to avoid the main heat source by lying at the opposite side of the box. Bedding should be easy to clean and change. The box should be made of a material that is impervious to fluids and easy to disinfect and should be cleaned at least twice daily for the first 2 weeks. Blankets, towels and fleece make good bedding choices. They should be washed in detergent that is non-perfumed or dyed (for 'sensitive skin' brands). Bleach should be added to each load as a disinfectant, but it is important to have at least 2 rinse cycles to remove all bleach residue before puppies have contact with the bedding. If heating pads are used, they must be completely covered because puppies love to burrow to the heat source and direct contact with the pad may burn the thin skin on their abdomens and foot pads. If a heating lamp is used, care must be taken that it is no so close as to burn or overheat the bitch or puppies. Placing adhesive terrarium thermometers along each of the 4 walls of the whelping box, allows the breeder to know what the temperature is at the level of the puppies in all 4 sides of the box. The temperature should be 80-85F the first week (in one corner of the box), 80F for the second week and 75F for the 3rd week. Heating discs (Snuggle-Safe®) can also be used but should be covered with bedding to prevent direct contact with the puppies skin and foot pads.

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Use of a DAP® diffuser or spray (dog appeasing pheromone) can be used for anxious or maiden bitches. Classical music and dim room light while also help anxious bitches feel safer with their puppies. In most cases, other dogs and pets should not be allowed into the whelping room until the puppies eyes and ears are open, at which time socialization of the litter should commence. If necessary, oxytocin nasal spray can be administered to maiden bitches to help improve mothering ability and sedatives (acepromazine, trazadone or gabapentin) may be used but care should be taken to make sure the bitch doesn't become unstable on her feet with the sedatives as this will increase the risk of her stepping or laying on a puppy.

Whelping

Labor occurs in 3 stages. Stage 1 is preparation for delivery. Final relaxation of the cervix and vaginal canal occur. Minor contractions are present and sometimes can be seen visibly as a contraction on the side of the bitch or may be more subtle in that the bitch 'star gazes' for a few minutes and then resumes signs of early labor. Stage 1 can last from a few minutes to 36 hours. Maiden bitches tend to have longer Stage 1 labor than bitches who have had prior litters. Signs of stage 1 include heavy/frantic panting, nesting/digging, trembling or shaking. The temp drop usually occurs early in Stage 1. Signs of labor may be interspersed with periods of rest or sleep. The end of Stage 1 and the start of Stage 2 is marked by rupture of the first water sac. Some vulvar discharge may be present during Stage 1. Clear or white mucus is common and often a large mucoid plug will be seen which was in the cervix and is expelled when the cervix relaxes. Sometimes a light green, olive green or forest green discharge may be seen in small amounts. Large amounts of light green discharge may indicate prior fetal loss and placental separation. Green – black discharge indicates recent placental separation and is an indication to call for veterinary assistance right away.

Stage 2 and Stage 3 occur simultaneously and may last < 1 hour for small litters to over 24 hours with large litters. Stage 2 is fetal delivery and Stage 3 is delivery of the fetal membranes. Sometimes a fetal membrane is delivered with the fetus or shortly thereafter and sometimes multiple fetuses are delivered and then the fetal membranes of one or more are delivered. Puppies may be delivered either head first (60% of the time) or tail end first (40% of the time) and both are considered normal. Puppies that are delivered posteriorly (tail end first) may be more difficult because the smallest part of the fetus is delivered first followed by the wider part of the fetus (shoulders and head). Also the fur is basically going 'against the grain' during a posterior delivery, so if both sacs surrounding the fetuses rupture and it has taken too long to deliver the fetus, the canal may dry out and with the hair being pushed back during delivery, this can increase the friction and further slow the delivery of the fetus. Application of a combination of sterile lube and warm water using a feeding tube, along side the fetus, may facilitate delivery. Care should be taken not to put the feeding tube into the mouth of a puppy that is

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mistaken for a posterior delivery but is actually and anterior (head first) delivery. Time between puppies can be < 1 minute to up to 2 hours in normal deliveries. In large litters, the time gap between the last puppies may extend out a little bit longer (up to 3 hours) to allow for uterine shortening to get those last puppies close enough to the uterine body to allow delivery with their umbilical cords still intact.

Whelpwise® monitoring (tocodynomometry) may also be used to monitor delivery and ascertain concerns with uterine inertia or fetal obstruction earlier than what may be noted with just visual observation and physical examination findings.

While it is important to keep track of fetal membrane being delivered, it is not uncommon for retention of fetal membranes and this is nothing to be overly concerned about. In most cases, retained fetal membranes will be delivered either entirely in the first 24 hours port-whelping or will degrade and be shed in the lochia (normal secretions after delivery). There is no indication for a 'clean-out' shot of oxytocin after delivery. Each time the puppies nurse, oxytocin is released from the dam's pituitary gland (a portion of the hormone producing part of the brain), so the bitch is being dosed with oxytocin almost continuously after delivery. Giving a large dose of oxytocin only causes cramping in the uterus and is less effective than her own oxytocin release. Bitches with retained fetal membranes are at no higher risk for post partum infection than bitches who deliver all placentas by the time the last fetus is delivered.

As puppies are born, if the second sac has not broken be sure to break and remove sac from puppy immediately. The mouth and nose should be suctioned using an appropriate size bulb. The umbilicus should be clamped with a hemostat if the fetal membrane is still attached or there is continued bleeding and it should be tied off with suture, thread or dental floss. The puppy should be rubbed vigorously with warm hand towels or wash cloths, so that it is being stimulated and dried at the same time. The puppy's head should be pointed down so fluid drips out of the mouth and nose. DO NOT swing puppies as this may result in brain trauma or dropping the puppy. If the puppy is not breathing spontaneously, CPR is needed and should be provided via mouth to mouth respiration and gentle chest compressions on the chest just behind the elbows. The Rhenzong acupuncture point can be used to stimulate respiration by placing a 25 – 27 gauge needle at the base of the nose on midline and then twirling.

Breeders need to contact their veterinarian under the following conditions:

1) Pregnancy length longer than 67 days from the LH surge, 65 days from vulation, 60 days from day 1 of diestrus or more than 72 days from the last breeding
2) More than 4 hours between rupture of the first water sac and delivery of the first puppy
3) More than 30 minutes of hard straining without delivery of a puppy
4) More than 2 hours between delivery of puppies

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5) Any green-black discharge prior to delivery of the first fetus by more than 1 – 2 hours or increasing/large amounts of green-black discharge without signs of uterine contractions
6) Any significant frank bloody discharge at any point during delivery
7) Bitches that have acute abdominal pain, collapse or shock-like signs at term or during labor

Whelping supplies
Towels – for pups and whelping box
Exam gloves
Sterile lube
Suction bulbs
Thread/dental floss/suture material
Betadine solution
Scissors
Incubator or warming box
Heat source
Oxygen with regulator and face mask (check w/vet)

Post Whelping Supplies
Feeding tube
Syringe for feeding tube
Milk replacer
Nursing bottle with low-flow nipple
Lactobacillus
Scale (down to 0.1 oz increments)
Optional:
Subcutaneous fluids needles and syringes (check w/vet)
Antibiotic drops (check w/vet)

Post whelping care of the bitch

Any change in the bitch's attitude or appetite should be considered a potential signs of post-partum disease. Temperature should be monitored twice daily the first week post-whelping, and any elevations above 103°F require consultation with a veterinarian.

Bitches should be checked daily for mastitis beginning a day or two before whelping and continuing through weaning. Any firm, painful, reddened glands or abnormal color to the milk should be carefully monitored. Mastitis may present as a unwillingness to allow puppies to nurse, growling at puppies when they approach or a stiff, stilted gait. Fever is common and sometimes arises very quickly. Mastitis will need to be treated with antibiotics, fluid support, and compressing to reduce edema/swelling and pain in the mammary gland. Mammary gland abscesses (gangrenous mastitis) need to be surgically opened and drained as soon as possible after diagnosis to prevent sepsis. The puppies should be kept away from any infected discharge that may come from an abscessed mammary gland after surgical drainage. Mastitic glands will benefit from hot compressing followed by cold cabbage leaf compressing, to help reduce edema and facilitate emptying of the gland. Having the puppies nurse out a mastitic gland is much

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more effective than hand stripping although sometimes puppies won't nurse a mastitic gland because the milk tastes different.

Infection of the uterus, called metritis, requires immediate veterinary attention. Metritis may be suspected if there is any odor to, excessive amounts of vulvar discharge, or any change in the normal color of the post-whelping discharge (initially dark brown, black, or green and then turning to dark red and mucus like in consistency to finally light pink and mucoid). Bitches are usually febrile (sometimes > 105F), depressed and anorectiv. Metritis is treated with antibiotics and fluid support. Puppies should be kept away from the discharge coming from the uterus. If untreated, sepsis and DIC (disseminated intravascular coagulation) may develop, leading to death.

Any trembling, muscle twitching, rigidity, facial grimacing or excessive facial itching requires immediate veterinary attention as this may be a sign of low calcium (called eclampsia or hypocalcemic tetany). Untreated this can lead to seizures and death. Eclampsia is a true medical emergency. Best diagnosed with ionized calcium but if not available then need to correct serum calcium for albumin first. Treatment is calcium intravenously while simultaneously monitoring for arrhythmias. Oral calcium (Tums®) is provided once calcium levels are restored to normal. Puppies are generally removed for at least a few days prior to attempting to allow them to nurse a couple times daily while monitoring for recurrence of symptoms. If symptoms return, then the puppies must be weaned. If they do not return, the puppies can nurse a few times daily but not as frequently as they would normally nurse, meaning that supplementation will have to be provided to some degree.

Poor mothering behavior may also be a sign of low calcium or may be related to inadequate or inappropriate environment in which the post-whelping bitch is placed, raising her level of concern for the safety of her puppies. Calcium should not be supplemented unless a diagnosis of hypocalcemia has been made by a veterinarian because supplementation of excess calcium may actually increase the risk of a bitch developing the disease because her own mechanism of mobilizing calcium quickly is dulled by the increase in oral calcium.

Bitches can be very picky eaters during the first week post-whelping, but should be eating something and should remain interested in the puppies. Any signs of depression, disinterest in the puppies, or detachment should instigate an examination. If puppies are not gaining appropriately, it must be determined if it is because the bitch isn't producing enough milk (large litters and too many puppies nursing; small litters without enough stimulation; inadequate mammary development; anxiety) or if there is a health concern with the puppies. In some cases, providing an antacid, like famotidine or omeprazole will improve the appetite.

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Neonatal care in the first 2 weeks

Minimal intervention should be provided in terms of puppy handling during the first 2 weeks. Puppies should be weighed twice daily during the first week and once daily during the second week. Puppies should gain between 8-10% and up to 20% of their body weight daily. Puppies not achieving this amount of gain, require special attention.

They should get private nursing time after removing all puppies from nursing for 1 hour. They should be placed on the back teats as these have the most milk and are typically the easiest to nurse. If this doesn't result in adequate daily gain, they should be supplemented either by bottle or by tube feeding. Bottle feeding should be provided using an adequate length and size of nipple. In general, the 'pet nurser' nipples will only work for the tiniest of puppies (4 oz or less). Larger puppies require and longer, wider nipple to engage the latch point on the back of the tongue. In most cases, puppies over 4 oz can be fed with a human infant, low-flow nipple. The size of the hole on the nipple should not be enlarged. The puppy should have to work to suckle at least to some degree. If milk flows too easily, the back of the mouth can easily be overfilled with milk, increasing the risk of aspiration pneumonia. Puppies that are not strong enough to nurse can be fed using a sponge. Syringe feeding is not recommended directly out of the syringe as the risk of aspiration is very high. Tube feeding is very safe (probably the safest form of supplementation) but requires training to perform correctly and the size and length of the tube will have to adjusted as the puppies grow. Any puppy that cannot latch onto the bitch effectively or that cannot nurse effectively should be checked for a cleft palate or hare-lip.

Puppies that constantly nurse or cry indicate a problem either with the puppies or with the bitch. Puppies should nurse frequently (every 1-2 hours) but then have activated sleep (twitching while sleeping) in between nursing. Puppies that nurse constantly are probably not getting adequate milk. Puppies that cry, whine, are bloated, separate themselves from the rest of the litter, do not have activated sleep, develop diarrhea or irregular respiratory patterns, develop skin infections, or have red, swollen umbilical stumps should have immediate veterinary attention. Puppies that are bloated or vocalize after nursing may be treated with 0.1 ml simethicone (Gas-X® pediatric elixir) up to 4 times daily. If the crying is due to gas alone, the simethicone drops provides rapid relief (within 15 – 20 minutes of dosing).

Puppy handling

In terms of actual puppy handling (other than feeding, weighing and cleaning the box) should be restricted to about 5 minutes of handling twice daily. Puppies should be held with the head pointing in all different directions (head up and down and lying on both sides for 30 seconds each position), the toes should be tickled with a cotton swab on all 4 feet and the puppy should be placed on a cool washcloth once daily. The puppy should immediately crawl off the washcloth towards the heat source. If the puppy

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doesn't move off the cool cloth immediately, this activity should not be included as it may result in chilling. Performing each of these handling exercises (Superdog® handling program) twice daily has been shown to decrease reactivity of the puppies as they get older. Overhandling of puppies between birth and eye/ear opening may result in increased reactivity as puppies get older and as adults.

Once puppies eyes and ears are open they should start to be socialized with other animals in the home and with other people. Any people being exposed to the puppies who do not live in the home should come wearing clean clothes that haven't been around other pets, and clean shoes and socks (or have shoes removed at the door).

Hands should be washed before handling the puppies. It is good for puppies to meet and be handled by many different types of people (men, women and children of multiple racial backgrounds). As many different types of clothes as possible should be worn (including different hats, shirts, including hoodies, pants and glasses). The rules of seven are that puppies should be exposed to as many different things as possible prior to weaning (and entering their first fear stage at 7 weeks of age) – noises/sounds, types of food, types of flooring/footing, types of toys, surfaces to eat and drink from, etc. The more things a puppy sees or does by 7 weeks of age, the easier it will be for it see or do it again when it is older.

Most puppies will have their first vaccines around 7 weeks of age but this may be adjusted based on the bitch's nomograph or titer testing of the puppies around 5-6 weeks of age. Most puppies will go to their new homes between 7.5 and 8.5 weeks of age, just as they are enterring their first fear stage. Some breeders of toy breeds will hold onto puppies until they are 10-12 weeks of age unless their new owners are planning on staying home all day or are taking them to work with them because they may become hypoglycemic if they don't get a mid-day meal. Effort should be made to have the puppies fully weaned from the bitch at least 2- 3 weeks prior to going to their new homes. This will ensure they are eating well, gaining weight and can be independent of the dam and thrive. Taking the puppies for car rides and providing some crate training is also highly beneficial before they enter their first fear stage. Litter pan or potty pad training will help with housebreaking.