



Feeding for Fertility

By Ness Bird - Nutrition Adviser and RVN CertCFVHNut ©

Dogs are no different to people in that lifestyle factors have significant effects on all aspects of our health, and just like us, they need to eat well and sleep well. A complete and balanced diet that is enjoyed and well digested is imperative, since sub-optimal nutrition can reduce reproductive performance. Physical and psychological stress can have negative effects on the stud dog and brood bitch, so the ideal fertility diet should support both body and mind.

Every Arden Grange recipe includes nutraceuticals (natural supplements that provide extra nutritional support), and the Performance Diet has some exceptional additional features. This product is primarily intended for dogs who are the most at risk of metabolic stress, but its use is not limited to those undertaking working or sporting activities. In fact, it has many elements that "feed" the immune and reproductive systems, resulting in a highly appropriate fertility diet.

Of course, any diet must suit the individual dog for it to reap benefits. Check list: -

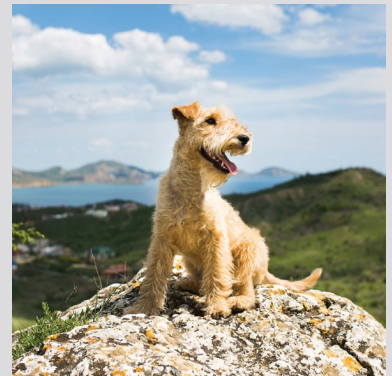
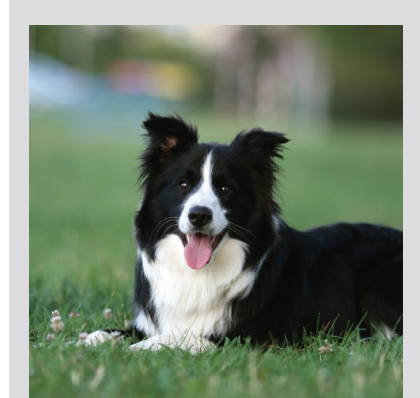
1. Is the diet enjoyed and readily accepted? Insufficient food intake is a risk since an underweight dog may be lacking in the essential nutrients required to support fertility. Energy loss may also be a consequence, and for a successful mating, both dog and bitch need to be in peak physical fitness.

2. Is the diet well digested? Loose stools mean that the body will not be able to glean the full benefits of the nutrients in the food, and this can result in loss of weight, condition, and energy, and even nutrient deficiencies over time. There are multiple causes of diarrhoea, but adverse food reactions should be considered, particularly if infectious and medical causes have been ruled out.

3. Is the energy density appropriate? The physical act of mating can prove difficult for overweight / unfit dogs. Fat is not just a storage tissue, it also secretes sex hormones, including testosterone, progesterone, oestrogens, and leptin. Overweight dogs may produce more leptin, which modifies the hormones secreted by the hypothalamus of the brain. If too much leptin is released it can disrupt the fine balance between the other sex hormones. Research is still ongoing in the bitch, but it is suspected that being overweight can increase the risk of anovulation, ovarian cysts, and early embryonic death, as can be the case for women.

Overweight people and pets also often have a slightly higher body temperature. Both the sperm cells and eggs are sensitive to temperature variations. In the male, if fat tissue infiltrates the scrotum and the temperature then increases, this can lead to dysfunctional sperm cell production or even stop their manufacture completely.

4. Are the skin and coat in excellent condition? A scurfy coat and poor skin could indicate an unsuitable diet. The immune system needs to be in tip-top form for reproduction, and not hindered by poorly digested ingredients, dietary allergens or high histamine foods. Multiple vitamins and minerals play a role in skin and coat health, so if there is room for improvement, a diet review may be in order.





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Arden Grange Performance features & benefits for your stud: -

Extra vitamin C & vitamin E

Vitamin C has antioxidant properties and helps to protect the sperm's DNA from free radical damage. Free radicals are reactive oxygen species that can cause significant damage to cell structures. Vitamin E also has powerful antioxidant properties and helps protect the sperm membrane [Muhammad, 2017]. A 2015 study demonstrated that poor semen quality in dogs with low levels of seminal plasma superoxide dismutase (a protective enzyme), can be improved by vitamin E supplementation [Kowakami, Kobayashi, Hori & Kaneda, 2015]. Arden Grange Performance is supplemented with 750mg/kg vitamin E.

Added L-carnitine

L-carnitine is more commonly known as a nutritional supplement that helps to boost the metabolism and support the heart, but it is also important for male fertility. It is found naturally in certain foods and can also be produced in the body from the amino acids methionine and lysine. L-carnitine is concentrated in the sperm and highly concentrated in the epididymis (the tube that stores and transports sperm) of the testicle. Its reproductive benefits include initiation of sperm motility, helping the sperm to mature and enhancing their fertility. L-carnitine also plays a role in the regulation of Sertoli cell function (cells that create a barrier between the blood and the testis and nourish the sperm) and helps to protect the sperm from oxidative damage. Studies have demonstrated that L-carnitine supplementation can improve sperm chromatin (the DNA and associated proteins within) integrity [Tabesh et al., 2012]. Arden Grange Performance contains chicken and egg which are good natural sources of L-carnitine and lysine, and maize which is a good source of methionine. It is further supplemented with 50mg/kg L-carnitine.

A highly bioavailable source of zinc

A source of zinc that is easily utilised is important because zinc deficiency may be responsible for a low sperm count. It also plays an important role in the synthesis of genetic material (DNA and RNA). Zinc may act as an antioxidant and anti-inflammatory factor within the sperm. This important fertility mineral also facilitates the capacitation of sperm; destabilisation of the head membrane to enable the acrosome reaction (penetration of the outer layer of the egg and fusing with the oocyte membrane), and changes to the tail - allowing greater mobility [Hosseinzadeh Colagar, Fallah and Mohammad-Hasani, 2018]. Arden Grange Performance contains chicken and linseed which are good natural sources of zinc, and it is fortified with a chelated zinc supplement which is a stable, water-soluble product that is very easily absorbed and assimilated.

Arden Grange Performance features & benefits for your brood bitch: -

Enriched with Omega-3 essential fatty acids

It is well-known that DHA is important for foetal brain health, but Omega-3 essential fatty acids have great benefits prior to conception too. Omega-3s have been scientifically proven to help fertility since they regulate hormones, promote ovulation, increase cervical mucus and improve blood flow to the reproductive organs [Cline, 2012]. Arden Grange Performance contains krill (an excellent source of EPA and DHA) and linseed (a rich dietary source of ALA).

Highly bioavailable sources of iron & selenium

Insufficient iron can prevent ovulation or result in the ovaries failing to mature or release the eggs. If eggs are produced, they are less likely to be healthy. Too much iron however can have toxic effects, so a diet that includes the correct level is essential. Using a complete and balanced product avoids the need for potentially risky supplementation (unless under your vet's guidance to correct a deficiency). Selenium helps to promote healthy ovarian follicles that develop and release the eggs. Arden Grange Performance contains chicken livers, rice, linseed and krill, which are all good natural sources of iron. Krill is also a good source of selenium, as is chicken, selenium yeast and egg which you will also find in this recipe.



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Extra folic acid (vitamin B9)

Folic acid is essential for healthy foetal development, but also prior to conception since it can reduce the risk of problems with egg production. It's essential to ensure your bitch has a sufficient level before she is mated, so that her increased demands during pregnancy are met from the onset. Studies have shown that folic acid can decrease the risk of cleft palate, but folic acid is not just important for bitches - it can help improve sperm count and quality too. The B vitamin family compete for absorption within the small intestine, so it is crucial that a fertility diet contains bioavailable forms at suitable levels. Arden Grange Performance is fortified a higher level of folic acid than the adult maintenance diets. It also contains extra thiamine (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), pantothenic acid (vitamin B5), pyridoxine (vitamin B6), biotin (vitamin B7), and cyanocobalamin (vitamin B12).

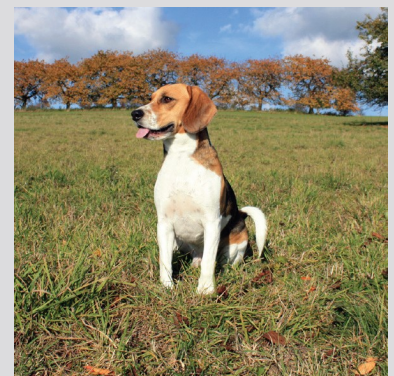
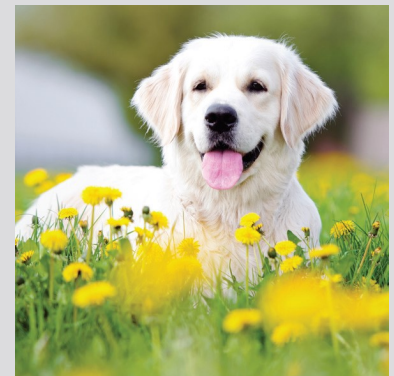
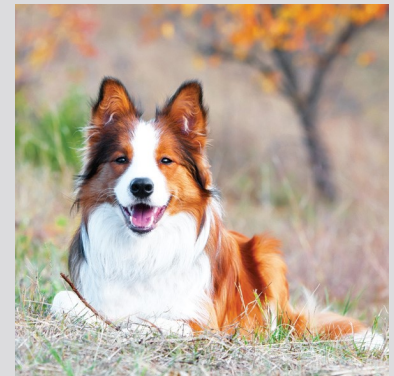
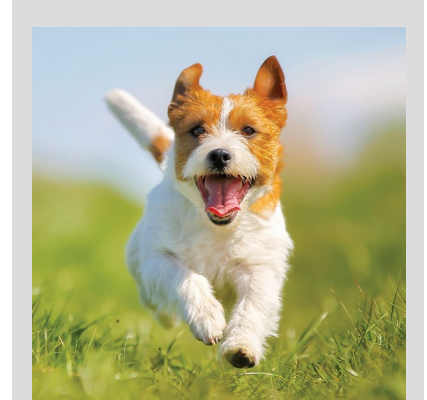
Arden Grange Performance features & benefits for both male and female fertility: -

A unique blend of special bioflavonoids (plant pigments with powerful antioxidant properties)

Protection from oxidative stress is especially important for the stud dog and brood bitch because an accumulation of free radicals (unstable atoms that can cause damage to the cells, including those of the reproductive organs) can have adverse effects on fertility. Breeding has the potential to increase free radical production due to the excitement / stress of travelling, meeting a new mate and new people, potentially staying in an unfamiliar environment and the act of copulation.

Grape seed extract* complements vitamin C, enhancing its effects, and has benefits to many systems of the body. In a reproductive context, studies have demonstrated that grape seed extract can help prevent ovarian aging [Liu et al., 2018] and protect the sperm from oxidative stress [Soleimani and Masoumi, 2017]. Arden Grange Performance contains 100mg/kg grape seed extract.

Quercetin is a water-soluble plant pigment. The ingredient used in Arden Grange Performance is derived from citrus fruits including oranges. Studies suggest that quercetin may promote antioxidant, anti-inflammatory, antihistamine, antiviral, and immunoprotective effects [Colunga Biancatelli, Berrill, Catravas and Marik, 2020]. In a reproductive context, a 2018 study demonstrated that quercetin increases the antioxidant capacity of the ovary by upregulating the expression of some oxidative stress-related genes [Wang et al., 2018].





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Sperm motility and viability may be enhanced by quercetin, and in a human study, it was shown to reduce DNA damage in post-thawed semen samples. Other research has demonstrated its potential role in protecting the sperm against oxidative damage by reducing the levels of MDA (a reactive aldehyde formed by lipid peroxidation) and improving the body's antioxidant enzyme activities [Fang and Zhong, 2019]. Arden Grange Performance contains 100mg/kg quercetin.

Green tea extract (*Camellia sinensis*) is a source of highly efficient free radical scavengers called catechins which may enhance sperm and egg quality and reduce DNA damage [Rahman et al., 2018]. Catechins also have antimicrobial properties [Reygaert, 2018] which is very relevant for the stud dog and brood bitch given the importance of maintaining a healthy, infection-free urogenital system. Arden Grange Performance contains 100mg/kg green tea extract.

Cranberries are included primarily for urinary support. They contain D-mannose and hippuric acid, which prevent harmful bacteria from sticking to the mucosal walls. They also contain arbutin, which is effective against certain bacteria and fungi, including *Candida*. Cranberry is also a source of antioxidants that may help fuel fertility by protecting the cell membranes of the sperm and egg from oxidative stress. Arden Grange Performance is fortified with a higher level of cranberry than the adult maintenance diets.

Additional features

- Energy dense (401 kcals/100g) lower feed portions / less waste
- 25% Extra prebiotic MOS a gut "security guard" that helps remove pathogens
- 25% Extra prebiotic FOS helps the friendly gut flora reproduce efficiently
- Primary ingredient is chicken an excellent source of tryptophan which is needed to produce melatonin and serotonin
- Added taurine for cardiac support
- 50% Extra glucosamine providing building blocks to synthesise joint cartilage
- 50% Extra chondroitin helping block destructive enzymes that break down joint cartilage
- 50% Extra MSM anti-inflammatory and analgesic properties, and synergistic with glucosamine & chondroitin
- Boosted level of vitamin A for immunity and cardiovascular / respiratory health
- Boosted level of vitamin D for healthy bones and muscles
- Boosted levels of B vitamins & choline to optimise the metabolism and improve energy production.

*Although grapes are toxic to dogs, grape seed extract is not. The substance which can cause canine/feline kidney damage is water-soluble and therefore found in the skin or flesh of the grape but not the seeds. It is possible that certain pesticides / herbicides or mycotoxins are a contributing factor. Our grape seed extract is from a reputable supplier who upholds excellent quality control standards and has conducted many studies into its safety.

As a responsible and ethical company, Arden Grange fully appreciates the caution that must be taken when discussing the potential benefits of our diets. Please be aware that feeding Arden Grange is not a guarantee of fertility. Mistimed mating, genetics, and a wide variety of external factors (e.g. exposure to persistent organic pollutants) may all contribute to the difference between success and failure.



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