



WALTHAM[®] pocket book of puppy nutrition and care



Edited by Dr. Richard Hill
and Dr. Richard Butterwick



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WALTHAM® pocket book of
**puppy nutrition
and care**



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DISCLAIMER

This book provides an introduction to key issues relating to puppy nutrition and care. It is not intended as a medical guide and should not be used as an alternative to seeking veterinary consultation or intervention where necessary.

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Foreword

Raising a puppy - a critical time for health and happiness

Everyone enjoys playing with a puppy. Puppies are so full of energy and enthusiasm. Puppyhood is, however, a critical time. Puppies soon grow into large and demanding dogs with sharp teeth. Mistakes during this critical time period can fundamentally change a puppy's relationship with people and other dogs and also influence their health and wellbeing. This booklet provides a succinct and readable introduction to key steps in the nutritional and behavioural development of puppies.

How a puppy is fed is critical for future health. A puppy that does not receive antibodies from his mother's milk immediately after birth has impaired immune function, making it much less able to fight off and survive infections (Page 9). A puppy that is fed a diet without sufficient calcium will develop soft bones that are easily fractured, whereas a large breed puppy that is fed too much calcium is likely to develop joint problems (Page 21). Overfeeding of puppies is a common issue that can have long term consequences for the mature adult. Treats are a useful tool for training and are fun to give, but owners need to use these responsibly as too many treats can cause obesity or nutrient imbalances. Obesity is the most common nutritional health issue in adult dogs. There is now good evidence that keeping large breed dogs trim from the time they are puppies can increase lifespan by an average of two years and markedly reduce the incidence of arthritis. It is much better to prevent obesity than to cure it. Fat usually accumulates gradually as a result of small excesses in calorie intake over many years, whereas noticeable weight loss over a few months requires a 30% reduction in food intake. Weight loss is especially difficult in large breed dogs because a 30% reduction in intake results in half the weight loss that it does in a small breed dog. Females are at particular risk of gaining weight when they are neutered because appetite increases and energy requirements decline as a consequence of neutering. It is vital, therefore, to restrict the amount of food fed to puppies to keep puppies lean. Some guidelines as to how much to feed are provided (Page 16 and 17) but there is considerable variation in the energy requirements of individual dogs. It is essential to adjust the amount fed to ensure a lean body condition. Owners should remember that a plump puppy is probably overweight.

It is a sad fact that an astonishingly large number of dogs are relinquished to animal shelters. Some dogs are relinquished because they do not fit an owner's lifestyle so choosing the right puppy can be important (Page 27). More commonly, dogs relinquished to shelters have behaviour problems that originate from when they were puppies. The socialisation period from 3 to 12 weeks of age (Page 11) is critical for behavioural development. The practice of separating a puppy from its mother before eight weeks of age should be strongly discouraged because early separation can result in an adult dog which does not interact well with other dogs. Similarly, inadequate exposure to human beings before 12 weeks of age can result in a dog that does not interact well with people. It is possible to socialise dogs later in life but doing so is difficult and time consuming so knowing how to socialise a puppy is important (Page 31).

Training as the puppy grows should emphasise reward rather than punishment (Page 35). Inappropriate punishment only confuses a dog and may result in a submissive, fearful or unpredictable animal. Dogs love attention so ignoring a dog is more effective than any physical dissuasion. Turning one's back on a puppy that is jumping up to seek attention is more effective than pushing the dog away; the latter will be interpreted as a reward and encourage further jumping. Instead, a puppy should be positively rewarded with attention or food when it is sitting quietly or doing some other activity that the owner desires.

Veterinarians should always be consulted about the care of a puppy (Page 40). They can assess body condition, give advice about feeding and recommend insurance. The timing of administration of routine medications and vaccines is also critical. Puppies are at increased risk of parvovirus and other viral infections as maternal immunity wanes from 6 to 16 weeks of age. Nearly all puppies are born with round worm infections and start excreting round worm eggs from two weeks of age so parasite control should be discussed with a veterinarian. It is also much easier to begin to teach a dog to allow its teeth to be brushed at an early age rather than later.

Thus, there are many critical moments in a puppy's life from the time they are born until they reach adulthood. In each instance, to quote Benjamin Franklin, "an ounce of prevention is worth a pound of cure". This booklet provides a time-line for what to expect and should help the reader raise healthy, happy and well adjusted puppies.

Dr. Richard Hill

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WALTHAM®

High quality innovative science, conducted in a caring way

For nearly 50 years WALTHAM® has been a leading authority within the field of cat and dog nutrition. WALTHAM® science and publications have been instrumental in defining the nutrient requirements of cats and dogs. Ensuring that the daily nutrient intake meets those requirements to sustain a healthy life is never more important than during the phases of growth and development. The nutrition and care received in the early days can have a lasting impact on the health and wellbeing for the rest of a pet's life. For this reason, WALTHAM® continues to invest in research to understand the nutrient requirements of growing pets in addition to those required throughout adult life.

WALTHAM® scientists work in partnership with the pets at the WALTHAM® Centre for Pet Nutrition to conduct pet-focussed research that supports Mars Petcare. This work delivers scientific breakthroughs in the area of pet nutrition, health, wellbeing and behaviour.

In collaboration with global scientific institutes and experts, the WALTHAM® team of scientists, carers and trainers support leading Mars Petcare brands such as Whiskas®, Pedigree®, Trill®, Cesar®, Sheba®, Aquarian®, Winergy®, Nutro® and Royal Canin.

Understanding the unique nutrition and care needs of the growing puppy is essential for ensuring that puppies develop into healthy, sociable and well-mannered adult dogs. This book aims to provide a valuable introduction into the nutrition and care requirements of the growing dog and to provide practical advice for anyone interested in pets, from the pet owner to those working within the pet food industry.

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Introduction

The importance of puppy nutrition and care

Many years of scientific research have established that the essential nutrient requirements of the growing puppy differ from those of the adult dog. It is now also well documented that dog size influences the duration of the puppy growth phase, with smaller breed puppies maturing much more quickly than larger breeds. Provision of a diet designed specifically for puppies throughout the growth phase will provide the best start towards a long and healthy life.

Alongside nutrition, establishing a high quality care regimen that includes socialisation and training has also been shown to be essential to ensure a puppy develops into a well mannered adult dog that is a pleasure to be around. Early socialisation experiences will leave a lasting impression upon a puppy.

Veterinary care is also essential for growing puppies to ensure they remain fit and healthy. Owners should discuss vaccinations, parasite control and neutering with their veterinarian, as well as any other concerns they may have. Provision of a well designed nutrition and care regimen in the early days will have a positive impact for the rest of a dog's life.



Stages of development

From newborn to adult

The development of puppies can be divided into four distinct stages: the neonatal period; the transitional period; the socialisation period; and the juvenile period¹. These developmental periods are followed by adulthood.

The Neonatal Period (birth to 2 weeks of age)

Through this period puppies are relatively helpless, relying entirely on their mother.

At this stage, the majority of a puppy's time is spent either sleeping or eating. Puppies' eyes and ears are closed when they are born but they are sensitive to touch and smell. The eyes open at around 10 days old but puppies do not respond to light and moving stimuli until the transitional period (two to three weeks of age).

Neonatal puppies have limited movement and are only capable of a slow crawl. They are not yet able to stand and support the weight of their body. During this period a puppy will actively seek its mother. If separated from its mother, a puppy will start to vocalise and crawl, swinging its head from side to side in an attempt to find her. At this stage puppies have a reduced ability to regulate their body temperature and so rely on their mother and littermates for body heat.

During this period puppies are only able to feed by suckling from the mother. It is essential that puppies consume colostrum in the mother's milk within the first 24 hours after birth, as this provides essential antibodies. Urinating and defecating is stimulated by the mother licking the anogenital region, and she keeps the nest area clean by eating any waste products.

Handling puppies for short periods during the first two weeks of age has been shown to be beneficial to their behaviour later in life.





Stages of development

From newborn to adult

The Transitional Period (2 to 3 weeks of age)

This stage lasts for one week and is a time of significant change for a puppy. Over this time the eyes begin to respond to light and movement. The ear canals open at approximately eighteen to twenty days of age. Movement skills improve and puppies start to walk and stand. Social behaviours, such as growling, tail wagging and play fighting begin to develop over this period. Investigative behaviour also begins and by the end of the transitional period puppies respond to humans and other animals. Instead of only vocalising in response to cold or hunger, this now also occurs when a puppy finds itself in an unfamiliar environment.

Lapping and chewing behaviours also begin to develop. Puppies start to show some interest in trying their mother's food, although all their nutrition still comes from the mother's milk. By the end of the transitional period puppies are able to urinate and defecate without their mother's stimulation, and often leave the nest to do this.

As with the neonatal period, regular handling of puppies for a few minutes each day has been shown to be beneficial to their behaviour later in life.

The Socialisation Period (3 to 12 weeks of age²)

The experiences encountered during this stage, negative or positive, can have profound effects on the behaviour of a dog later in life. Over this time puppies are more sensitive to socialisation. Similar to the transitional stage this period is full of changes, particularly in puppies' social behaviour.

Many behavioural changes occur at this stage. The most notable of these is the appearance of play signals that increase in complexity throughout the socialisation period. Investigative behaviour begins to increase. Puppies will readily approach new people and situations with interest, willingly interacting with humans.

The socialisation period is particularly influential in the development of a stable temperament in the adult dog. During this phase, puppies are very willing to experience new situations and environments, and thorough socialisation and habituation to novel circumstances will help prevent fearful reactions when adult. Many social and behavioural problems observed in adult dogs are believed to be linked with poor treatment or insufficient interaction during this stage of puppy development. If puppies do not have the breadth of experience needed, they may subsequently approach new situations with fear.

Puppies begin to sleep less and play more. Predatory actions develop, such as pouncing, shaking and stalking of both their littermates and inanimate objects. It is during this stage that puppies begin to learn to control their bite. This control develops through a 'yelping' response of their playmate, thus letting the puppy know the bite was too hard.

Puppies also become much more vocal during this time with the appearance of play barking and growling in addition to distress vocalisations. Vocalising for the attention of their mother still occurs, though to a much lesser extent than in the neonatal and transitional stages.

The milk teeth begin to appear at three to four weeks of age and puppies increasingly eat solid food. As they make the transition onto solid food puppies need access to drinking water. The mother will gradually begin to discourage her puppies from suckling and the litter will be fully weaned by six to eight weeks old.

The best time for puppies to leave their mother and littermates and go to their new home is around eight weeks of age. Being separated from its mother earlier than this may be detrimental as a puppy may not be fully weaned and will also miss out on important social development time with its mother and littermates. Rehoming later than eight weeks may mean that new owners miss out on important socialisation time.





Stages of development

From newborn to adult

The Juvenile Period (12 weeks to adulthood)

By the time the juvenile period is reached, most of the major changes have taken place. A puppy, however, is still growing and physiological changes are occurring that may not be apparent to the owner.

All of the sense organs are fully developed at the onset of this stage and the rate of growth slows. The milk teeth are replaced by adult teeth and this is usually complete by seven months of age.

Puppies have similar motor skills to adults by the age of six months, although this can vary according to the individual dog and their environment. Socialisation should continue and a training programme should be formalised. Puppies have a short attention span and may be excitable. Training, therefore, should be short, consistent and fun.



Sexual maturity is marked by the first season in bitches and the ability to achieve a fertile mating in dogs. This usually occurs at around six to seven months, although males may show sexual interest in females before this point. However, even though they are sexually mature and may be close to their full size, puppies are still developing and are not considered adults at this stage. This is a good time for owners to discuss neutering options with their veterinarian.

The length of the juvenile period varies according to breed size. Smaller breeds reach adulthood at around one year. Large and giant breed dogs mature more slowly and are not considered fully adult until 18 to 24 months.

Lactation and weaning

The transition from milk to solid food

Mothers generally suckle their puppies for at least six weeks. For the first four weeks of life all of a puppy's nutritional needs are met by the mother's milk.

Weaning begins between two and three weeks of age when a puppy will start to show an interest in its mother's food and lap water from a bowl. Puppies can be offered finely chopped wet puppy food, dry food that has been softened with water or a specific weaning product such as a complete and balanced puppy porridge. Foods offered during weaning need to be specifically formulated for puppies. Offering small amounts of food during the early stages of weaning helps a puppy's digestive system adapt from milk to solid food and reduces the demands on the mother. It is essential that puppies are offered puppy food by 4 weeks of age as the nutrient content and the quantity of milk are no longer appropriate to support healthy puppy growth if fed exclusively. Puppies become fully weaned by 6-8 weeks of age, after which they are ready to leave their mother.





Growth rates

Healthy not maximal

Different sizes of dogs grow at different rates and become adult at different times. A toy breed dog is fully grown in less than one year whereas a giant breed dog can take almost two years to achieve its adult size. All dogs grow rapidly during the first few months before slowing to a reduced rate of growth^{3,4}. Even after a puppy reaches its adult bodyweight further physiological developments continue for some time.

Puppies need to grow at a healthy rather than at a maximal rate. Puppies that grow too quickly are more likely to develop skeletal disorders, such as hip dysplasia, as well as becoming predisposed to obesity and its clinical consequences. It is particularly important that large and giant breeds grow at a slower rate than small breeds because they are particularly at risk of the skeletal disorders associated with rapid growth.

The optimal rate of growth for particular breeds of dogs is a controversial research area. The following approximate rates of growth for different sizes of dog are recommended.

Age in months	Percentage of adult weight		
	Small & medium breeds mature weight <25Kg	Large breeds mature weight 25-45Kg	Giant breeds mature weight >45Kg
1	9%	7%	6%
2	22%	20%	14%
3	37%	35%	26%
4	52%	48%	38%
5	61%	57%	49%
6	70%	65%	60%
9	83%	77%	70%
12	95%	88%	80%
15	Adult	94%	90%
18	Adult	100%	100%
21	Adult	Adult	Adult

Table 1: Recommendations for growth rates of various sizes of dogs. Adapted from NRC (2006). (1Kg=2.2lbs)

Feeding a puppy

Fuel for growth

Puppies have different nutritional requirements compared to adult dogs and it is important that puppies are fed a suitable diet for growth. It is also essential that puppies receive the correct number of calories to support their rapid growth.

Energy Requirements

Although energy requirements vary with breed, newly weaned puppies require approximately twice as much energy per Kg bodyweight when compared with adult dogs. This reduces to 1.6 times the energy when puppies reach 50% of their adult body weight and 1.2 times the energy when puppies reach 80% of their adult bodyweight. This can often mean that the same amount of food is offered, despite the puppy significantly increasing in size. For example, a Labrador puppy with an expected adult body weight of 30Kg requires the same number of calories at both 6 months and 9 months of age despite weighing 3.5 Kg more.

The National Research Council (NRC) gives the following equation to estimate the energy requirements of puppies⁴.

$$\text{Energy} = 130W^{0.75} \times 3.2[e^{(-0.87p)} - 0.1]$$

Where W = actual body weight in Kg

Wm = predicted mature adult weight in Kg

p = W/Wm

e = base of natural log ~2.718

(1Kg = 2.2lbs)



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Feeding a puppy

Fuel for growth

The table below provides an estimate of the energy requirements in kilocalories of puppies based on predicted growth rates and the NRC energy requirement equation⁴.

It is important to note that these figures are merely a guide and adjustments must be made according to an individual puppy's growth rate to maintain an ideal body condition score. Owners should consult their veterinarian if they have any questions or concerns about their puppy's growth.

	1	2	3	4	5	6	9	12	15	18	21
1	56	97	123	137	140	141	adult	adult	adult	adult	adult
2	95	163	207	230	236	238	adult	adult	adult	adult	adult
3	129	221	281	311	320	322	adult	adult	adult	adult	adult
4	159	274	349	386	397	400	adult	adult	adult	adult	adult
5	188	324	412	457	469	473	adult	adult	adult	adult	adult
6	216	372	473	524	537	542	535	adult	adult	adult	adult
7	243	417	531	588	603	608	601	adult	adult	adult	adult
8	268	461	587	650	667	672	664	adult	adult	adult	adult
9	293	504	641	710	728	728	734	adult	adult	adult	adult
10	317	545	693	768	788	795	785	adult	adult	adult	adult
15	430	739	940	1040	1069	1077	1065	adult	adult	adult	adult
20	533	917	1166	1292	1326	1337	1321	adult	adult	adult	adult
25	532	1030	1349	1498	1551	1576	1575	1543	1516	adult	adult
30	610	1181	1547	1718	1778	1807	1806	1769	1738	adult	adult
35	685	1325	1737	1928	1996	2029	2027	1986	1951	adult	adult
40	757	1465	1919	2132	2206	2242	2241	2195	2157	adult	adult
45	744	1299	1836	2146	2341	2431	2455	2437	2385	2306	adult
50	805	1406	1987	2342	2533	2631	2657	2637	2581	2495	adult
55	865	1510	2134	2515	2721	2826	2854	2833	2772	2680	adult
60	923	1612	2278	2685	2904	3016	3047	3024	2959	2861	adult
65	980	1712	2419	2851	3084	3203	3236	3211	3142	3038	adult
70	1036	1810	2557	3014	3260	3386	3420	3395	3322	3211	adult

- Giant = adult weight of >45kg
- Large = adult weight of >25kg, up to 45kg
- Small & medium = adult weight up to 25kg
- Toy = adult weight up to and including 5kg

Table shows energy requirements expressed in kcal per day

Table 2: Recommendations for daily energy intake (kcal) for growing puppies, adapted from NRC (2006)

Number of meals per day

A young puppy has a small stomach therefore it is essential to offer small meals frequently to ensure that they can meet their high calorie requirements.

Birth to three weeks	Puppies rely solely on their mother's milk.
Three to eight weeks (weaning)	Puppies begin to take solid food. Puppies should be allowed free access to appropriate food in between suckling from their mother. During the latter stage of weaning it is advisable to feed puppies without their mother present. This will stop the mother eating and regurgitating food.
Eight weeks to four months	Puppies should be fed every 4 hours during a 16 hour day, with the first meal given early in the morning. After ten weeks meal frequency can be gradually reduced from four to three meals per day.
Four to six months	Meal frequency can be reduced to twice daily.
After six months	The adult feeding regime (one or two meals per day) can gradually be established.

The change in feeding pattern is dependent on the individual puppy. Owners should consult their veterinarian if they are unsure.



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Feeding a puppy

Fuel for growth

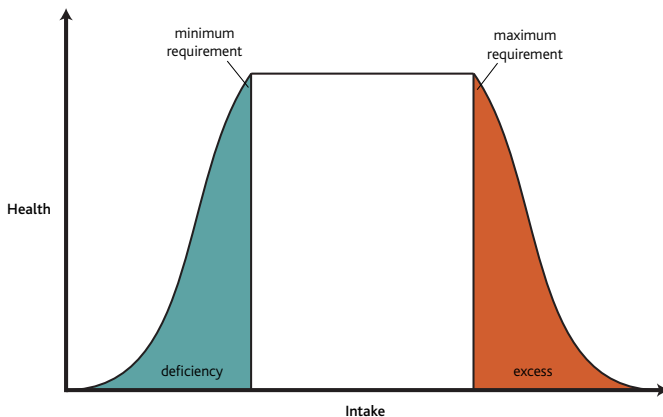
Puppy Nutrition

Puppies have nutrient requirements that are different from those of adult dogs. A nutritionally complete and balanced diet specifically formulated for puppies must be fed until adulthood. This may be provided by feeding either a wet or dry format or a mixture of the two. One of the most common causes of nutritional issues in puppies is switching to adult diets before puppies are fully mature.

Certain nutrients are particularly important during growth and it is key that a puppy receives the right balance of nutrients from the following groups. If intake of a nutrient is below the minimum requirement then health may deteriorate due to deficiency. If intake is above the maximum requirement, then health may be compromised due to excess.

Water

Water is the most vital nutrient for life and is a major constituent of an animal's body, making up 75% of the body mass at birth. Water has a role in all major physiological functions including providing a medium for transportation and delivery of nutrients, regulation of body temperature and lubrication of joints, eyes and the inner ear. Puppies receive the water they need via the mother's milk prior to weaning and, after this time, should be given access to fresh drinking water in a suitable container appropriate for their size. If puppies do not receive an adequate water intake, they will show signs of dehydration such as neck skin that stays tented when gently pinched, lethargy or a dry mouth.



Protein and amino acids

Protein provides amino acids which are the building blocks for growth. Puppies require significantly more protein than adult dogs and this is particularly important during the rapid growth phase up to 14 weeks of age. An insufficient supply of protein will result in poor growth and development. As well as ensuring the puppy receives an adequate supply of total protein, it is important that they receive the right amino acids in the right amounts. There are 10 essential amino acids for puppies which means they must be supplied in the diet because the puppy cannot synthesise them⁴. Some of the key amino acids are detailed below:

Lysine

This is an amino acid used for the synthesis of proteins so is vital during growth when new tissues are being generated. An insufficient dietary supply of lysine will result in poor growth and a reduced food intake. Too much lysine in the diet can cause signs of arginine deficiency (another amino acid) such as muscle tremors and vomiting^{4,5,6}.

Tryptophan

This amino acid is a precursor of niacin (vitamin B3) in dogs and is also required for the production of serotonin and melatonin which act to balance mood and sleep patterns. Tryptophan is also a building block of protein and a deficiency of this amino acid in the growing puppy has been shown to reduce weight gain^{4,7,8}.

Methionine

Methionine is often the first limiting amino acid in diet formulation. It is an important precursor for both cysteine and taurine and is also involved in the production of the antioxidant molecule glutathione and carnitine. A deficiency of methionine can lead to an immediate reduction in food intake, severe weight loss and skin problems^{4,7,9}.





Feeding a puppy

Fuel for growth

Fat and fatty acids

Fat is an important source of energy for fuelling growth. With approximately twice as many calories per gram when compared to protein or carbohydrate, fat represents a highly concentrated source of energy. As such, puppies have a higher daily fat requirement when compared to adult dogs to provide energy for this demanding lifestage⁴. Fats are made up of chains of fatty acids, some of which are considered essential for the healthy development of puppies:

Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) (omega-3 fatty acids)

These polyunsaturated fatty acids (PUFA) are termed omega-3 fatty acids and, although there is debate around their essentiality in adult dogs, there is evidence that they are required for the normal development of the brain and nervous system of the puppy as it grows in the womb. Analysis of the mother's milk has shown the presence of DHA which is known to be beneficial in the maturation of the nervous system in the growing animal. For these reasons, it is essential that puppies receive a supply of DHA, and its precursor EPA, from birth to adulthood^{4,10}.

Linoleic acid (LA) and arachidonic acid (AA) (omega-6 fatty acids)

Puppies need a supply of LA to develop and maintain a healthy skin and coat. Although adult dogs can synthesise sufficient quantities of AA from dietary LA, puppies are less efficient at this process and so also need a dietary supply of AA⁴.



Minerals

Puppies have specific mineral requirements that differ from those of adult dogs. Of particular importance are the amounts of calcium and phosphorus, required to form healthy bones and teeth.

Calcium and phosphorus

The amounts of both calcium and phosphorus and the balance of these minerals are of particular importance in puppies due to their role in the active formation of bones and teeth during the growth phase⁴. Too much or too little calcium results in abnormal bone development which can cause severe pain. Large and giant breed dogs are most susceptible to excess calcium in the diets and, therefore, stricter control is required in their diets¹¹. High levels of calcium can also reduce the absorption of phosphorus in the diet so the ratio of calcium to phosphorus must be tightly controlled. The ratio of calcium and phosphorus is also important for determining the requirements of vitamin D in growing puppies.

Zinc

Zinc plays a role in skin health and protein metabolism. If puppies do not have an appropriate zinc intake their growth is impaired and they will show signs of poor skin condition such as lesions appearing on the foot pads^{4,12,13}.

Iron

The primary role of iron is in the synthesis of haemoglobin and myoglobin where it functions to transport oxygen around the body. Iron also functions in a number of enzyme systems that are required in the production of energy. During growth, puppies are manufacturing large numbers of red blood cells therefore their need for iron is greater than that for adult dogs. If a puppy is not receiving enough iron symptoms such as poor growth, lethargy, weakness and diarrhoea may be observed^{4,14}.





Feeding a puppy

Fuel for growth

Vitamins

Puppies have vitamin requirements that differ from those of adult dogs.

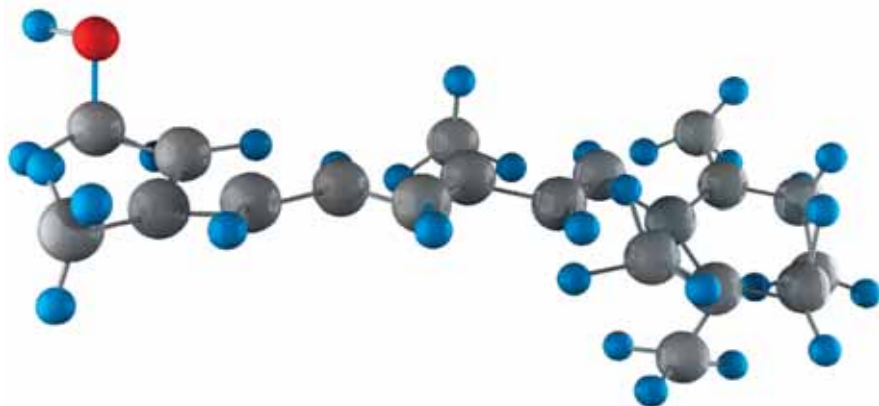
Vitamin D

One of the major roles of vitamin D is in the formation of healthy bones. Too little vitamin D results in rickets, characterised by bowed, extremely painful limbs⁴. Unlike humans, dogs cannot convert vitamin D to the active form using sunlight and are, therefore, reliant on their diet to provide this nutrient.

Vitamin A

Required for healthy vision, vitamin A is also involved in protein synthesis and is, therefore, critical for animals during growth⁴. A deficiency of vitamin A in puppies has also been shown to result in deafness¹⁵.

Vitamin A

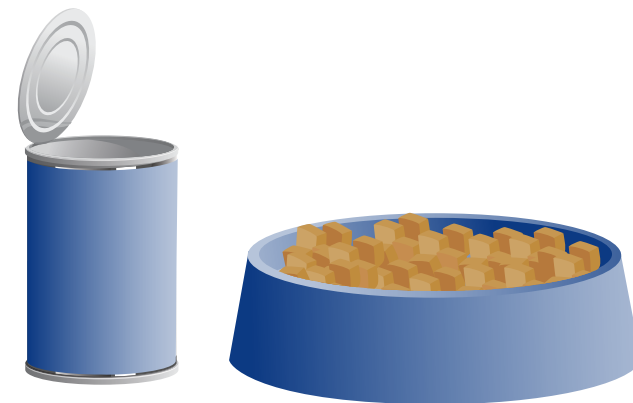


Importance of variety

Formats and flavours

Ensuring that a puppy is fed a variety of different flavours and types of food can be beneficial as it may help prevent fussy eaters when adult.

A varied diet can be comprised of different food formats (wet, dry or semi-moist), flavours or textures. When fed correctly wet, dry and semi-moist puppy diets are all carefully designed to provide the right nutrients in the right amounts. Exposure to variety early in life can result in dogs being more accepting of different diets when adult and can help to prevent an adverse response if a diet change is required.





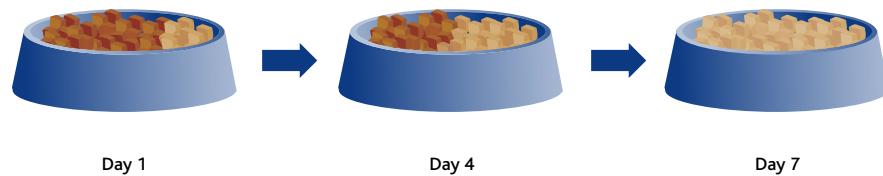
Changing diets

Avoiding digestive upset

Digestive upset is common in puppies. Rapid diet switches, in addition to other causes such as infectious agents, can lead to loose faeces, diarrhoea or vomiting.

The required portion size varies greatly between wet and dry diets because dry foods are more calorie dense. For this reason a gradual transition from one food type to another is recommended to allow time for adjustment.

When transitioning a puppy from one food type to another, it is recommended that the diet is gradually changed over a period of four to seven days, although some dogs may need longer. This should be achieved by adding a small proportion of the new diet to the puppy's regular diet on the first day. The proportion of the new diet should be gradually increased each day, so that it makes up half of the puppy's food on day four and the whole meal by day seven.



Treats

Making treats part of a healthy diet

Treats are particularly useful for training, but due to the risks of overfeeding, and nutritional imbalances their use must be carefully controlled. No more than 10% of the calories in a puppy's diet should come from dog treats which must be appropriate for their age. It is also essential to adjust the amount of main meal fed accordingly when feeding treats, to ensure the recommended daily calorie intake is not exceeded. The use of human foods should be avoided due to the risk of nutritional imbalances.

A number of dog treats may deliver a functional benefit such as supporting oral health or joint health. If feeding these, it is essential to check the manufacturer's guidelines to ensure they are appropriate for a puppy's age. Owners should also take care to ensure functional treats are fed at the recommended daily allowance.

If feeding a complete and balanced puppy diet, vitamin and mineral supplements may lead to a nutritional imbalance. Supplementation is not recommended unless advised by a veterinarian.





Feeding orphaned puppies

Taking the mother's role

Mother's milk provides complete nutrition during the first four weeks of a puppy's life. However, there are situations in which it may be necessary to hand rear puppies, such as when they are orphaned or when a mother has a large litter and cannot produce enough milk.

Caring for orphaned puppies is a large undertaking and veterinary advice is recommended. Puppies under the age of 38 days have a reduced ability to regulate their body temperature and will need a temperature controlled environment. Puppies initially need feeding every two hours with a milk substitute specifically designed for puppies and also stimulation of the anogenital area to provoke defecation and urination.

Puppies must be fed milk designed specifically to meet their nutritional needs. Milk from cows or goats must not be fed as the protein, fat and calcium levels are unsuitable. Milk substitutes must be prepared according to the manufacturer's instructions to ensure the correct nutrition and energy requirements are provided. Milk substitutes should not be fed to puppies who are receiving adequate nutrition from their mother's milk as this may lead to excessive energy intake or a nutritional imbalance.



Choosing and acquiring a puppy

Ensuring a suitable match

There are several hundred dog breeds to choose from even before considering the further possibility of cross-breeds. Although it is tempting to base puppy choice on aesthetically pleasing attributes, selecting the right breed of puppy should be based on a number of factors that will help to decide which type of dog suits the owner's lifestyle best.

Different dog breeds have been selected over many generations for specific behavioural and physical traits required to perform specific tasks. It is important to understand the behavioural and physical characteristics of each type in order to decide which one best fits with an owner's lifestyle. For instance, breeds within the herding category are intelligent, highly active and require plenty of mental stimulation which may be achieved via training. Guarding breeds may be large, less active and sometimes more territorial as they have been bred to alert their owners to intruders. Many toy breeds were bred solely for their affectionate temperament and are often small, making them ideal breeds for small households or apartments. A number of factors should be taken into consideration when selecting a puppy to ensure the best possible outcome in terms of the relationship:

How much space does an owner have?

The size of an owner's house and garden and the availability of open spaces nearby for exercise will influence the type of dog an owner should choose.

How much exercise will a dog need?

Owners must consider if they are able to give a dog the exercise he needs. Some breeds, such as the border collie, need more exercise than others. However, size is not always a good reflection of the amount of exercise needed. Some giant breeds, such as mastiffs for example, need less exercise than smaller breeds such as terriers.

How much will it cost?

The initial cost of a puppy must be taken into account, but other costs continue for the rest of its life. The daily cost of feeding a small dog is obviously less than that for giant dogs. Budgeting is also needed for veterinary visits (for both routine check-ups and unexpected problems), kennelling during holidays and regular grooming sessions for certain breeds. The cost of pet health insurance will also vary according to breed or type of dog.

How much experience of dogs?

New dog owners should not opt for breeds which are difficult to train or which easily intimidate their owners.





Long or short hair?

Long haired dogs need regular grooming to keep their coat clean and in good condition. The coats of short haired dogs need less attention and are more manageable in wet weather. Some breeds need regular hair clipping to keep their coat in good condition.

Male or female?

Male dogs tend to be larger than females. Females come into season twice a year as part of their reproductive cycle unless they are neutered or some other form of oestrous control is used.

Choosing a puppy

Observing a puppy with his littermates will provide an idea of his personality and temperament which can have a bearing on how well he will fit into his new home. Owners should try to include as many of the household members as possible in the selection of a puppy. Ideally, a puppy should be viewed with the mother and, if possible, a potential owner should ask to see the father as well. This may help give an idea of a puppy's size and temperament when adult.

Owners may choose to acquire their puppy from a breeder, a private home, a dog shelter or a reputable pet shop. Whilst any of these may be appropriate, they all have differences which need to be considered. It may be helpful for a potential owner to carry out some research and prepare some questions. For example:

- How old will the puppies be when they are ready to be homed?
- How has the puppy been socialised so far?
- Has the puppy been introduced to cats or children?
- What diet is the puppy being fed?
- What is the worming and vaccination history of the puppy?
- If buying from a reputable pet shop a potential owner should ask if they may speak to the original breeder for more information if required.





Caring for a new puppy

Providing a new home

Eight weeks old is a good time to home a puppy as this is still within the window of socialisation during which he is most receptive and adaptive to new experiences.

When an owner acquires a new puppy they should ask for a week's supply of the diet he is fed from the breeder so that they can continue to feed it for the first few days and then transition gradually to a new diet if they choose to.

There are a number of essential items that are needed prior to obtaining a new puppy:

- A bed which is easily washable
- A feeding bowl and water bowl
- A collar and lead. These will need replacing as the puppy grows
- Toys that are safe for puppies
- Suitable restraint for travelling in a car, such as a dog guard, puppy crate or dog seat belt harness
- Grooming equipment.

There are a number of ways in which the owner can help him adapt to the new surroundings. Using an item that contains the scent of the mother, such as a piece of bedding, can help provide a puppy with a familiar environment when entering the new home. Placing the bed in a puppy pen or crate can give the puppy an area where he may feel secure and provides a safe place for him to be left unsupervised at night and for short periods during the day.

Socialisation

Preparing for life

Good socialisation involves introducing the puppy to the world and is one of the most important things owners can do to ensure that their puppy grows up into a happy healthy dog. The main aim of socialisation is to introduce puppies to a wide range of different people, dogs, objects and situations. Puppies should be familiarised with anything that they might encounter in later life. All of these things should be encountered in a positive way so that the puppies do not become frightened. A well socialised puppy should be able to cope with new things that he may experience in later life.

The period from 3 to 12 weeks of age is a particularly important time for young puppies because at this age they are highly sensitive to the beneficial effects of socialisation². As owners usually take their new puppy home at seven or eight weeks of age, it is the responsibility of a good breeder to ensure that they do everything they can to socialise their puppies before they are homed. Although 3 to 12 weeks of age is the most important time for socialisation to occur, socialisation should not stop at the end of this period; puppies and adult dogs benefit from socialisation throughout their lives.

Meeting people

People come in all shapes and sizes and puppies need to meet lots of different people to ensure that they are confident with all humans when older. One of the best ways for an owner to ensure that their puppy becomes confident with people is to invite lots of different people to their house. It is also important for puppies to meet people of different ages, particularly children. It is important that encounters with children are controlled so that the children do not overwhelm or frighten the puppy.





Socialisation

Preparing for life

Meeting other animals

Puppies need to meet and interact with other puppies and older dogs so that they learn appropriate behaviour. This is important in preventing them from becoming frightened and potentially aggressive towards other dogs in later life. Owners should ensure that any adult dogs their puppy meets are well socialised and trustworthy with puppies, as it is essential to avoid negative experiences with other dogs. It is also essential that any adult dogs a puppy meets are healthy and fully vaccinated.

If a puppy is to live with other animals in the household such as cats then he needs to encounter them at an early age while carefully restrained to learn that they should not chase them. Similarly, it can be beneficial to allow a puppy to see livestock, while being prevented from chasing them, so that he learns that they are of little interest.

Novel situations and objects

Owners should familiarise their puppy with any objects that they may encounter in their daily life, particularly anything they may find frightening, such as vacuum cleaners, washing machines, televisions, umbrellas, bicycles and traffic. It is important to introduce the puppy to lots of different situations so that he learns there is nothing to be afraid of.



Travelling in a car

Owners must always ensure that their dog is appropriately restrained using a suitable dog guard, travelling crate or dog seat belt harness in the car. It is best to start with short journeys that end with enjoyable experiences such as going for a walk. Owners may find that allowing their puppy to eat some food or play with a favourite toy in the back of the car whilst the car is stationary helps him learn that it is a great place to be.

Being alone

It is really important to get puppies comfortable with being left alone for limited periods. Owners should begin by leaving their puppy alone in a room for a couple of minutes and gradually increase the amount of time. The time alone should be a positive thing, so providing suitable play toys in their absence will help to keep him occupied. An owner should start leaving the house for short periods and gradually increase the amount of time the puppy is left. The length of time alone should be varied so the puppy learns that the owner leaving doesn't always mean they will be gone for a long time. When leaving him alone it is important not to make lots of fuss saying goodbye; it is better to simply leave as if nothing is happening. On returning, it can help to ignore the puppy for a few minutes so he is not rewarded for any over-excitable behaviour. If he has had an accident and messed in the house owners should simply clean it up as if nothing has happened, and never punish him for it. It may also help to leave a radio on whilst out, so they have background distractions and so the home is not so quiet. This will also drown out any noises coming from outside that the puppy may react to.

Health checking and handling

Owners need to train their puppy to enjoy being handled by gently and calmly moving their hands all over his body. An owner should begin to look at his eyes, in his ears, open his mouth and gently feel each of his paws. All this should be done very calmly, giving plenty of praise and treats. This should get the puppy used to the way a veterinarian might examine them.

Long haired puppies should be introduced to brushing, so that they learn that it is an enjoyable experience, and breeds that may require hair clipping should be introduced to the sound of electric clippers so that they are not frightened the first time they go to the groomers.





Socialisation

Preparing for life

Puppy parties and training classes

Puppy parties and training classes are a great way to start socialising and training a puppy. Here owners can get good advice on basic training and puppies can meet a wide range of other puppies of all shapes and sizes, as well as different people. Puppy classes should be well structured and organised and should not just be a free play session for puppies as this can frighten young or less confident puppies. In addition, class sizes should be limited to no more than 10 puppies. Veterinarians can often recommend where to find good puppy classes.



Training

Reward good behaviour - ignore unwanted behaviour

It is never too early to start training a puppy. However, very young puppies get tired and distracted easily so this must be remembered when trying to train your puppy. A veterinarian should be able to recommend a good puppy training class. Good training starts with a formula of rewarding good behaviour and ignoring unwanted behaviour. Most dogs crave attention and even negative attention, such as scolding or shouting, can be rewarding and encourage further unwanted behaviour. Owners should not use punishment as it is a less effective training method and can lead to further problems.

Training to sit

An effective way to teach your puppy to sit is to lure him into a sitting position using a treat. When the puppy is standing the owner should hold a treat just in front of his nose and then slowly lift the treat up and over his head. He should follow the treat with his nose and tip his head back as he follows it, resulting in him putting his bottom on the ground. He should be rewarded by giving the treat and praise as soon as his bottom touches the ground.





Training

Reward good behaviour - ignore unwanted behaviour

Training to lie down

A good method to teach the down position is to hold a treat just in front of the puppy's nose when he is sitting and slowly lower it down to between his front legs. This should lure him into a down position. He should be rewarded with the treat and praise as soon as he is lying down.



Training to come when called

Recall is an important lesson for puppies to learn at an early age. This can be taught by asking a friend to hold the puppy while the owner walks backwards a short distance and crouches down. The puppy should be allowed to see that the owner has a treat in their hand and then the owner should call the puppy. The friend should release the puppy as soon as he is called. The puppy should be rewarded immediately when he reaches the owner with the treat and praise. This should be repeated, gradually increasing the distance, varying the location and with various levels of distraction.

Wearing a collar

A collar should be introduced as soon as possible and efforts made to teach the puppy to walk on a lead. Choosing the right size is important. The collar should fit so that two fingers easily fit underneath it. The collar is likely to need replacing as the puppy grows.

Walking on the lead

It is important for puppies to learn to walk on the lead without pulling so that both the puppy and the owner enjoy walks. When the lead is first attached, the puppy should be briefly allowed to drag it around. Next, the owners should pick up the end of the lead and let the puppy feel the resistance. A puppy should learn that pulling on the lead results in stopping rather than going forward. Owners should attach a lead to the collar and then encourage their puppy to stand near their side. The owner should then attract the puppy's attention by saying his name and start walking forward. When the puppy is walking by the owner's side without pulling they should be praised. If the puppy pulls on the lead the owner should stop so that the puppy cannot continue forward. They should then encourage the puppy back to their side and begin moving forward again. It can help to lure the puppy into position with a treat or a toy. Special harnesses and halters are available which can help prevent large or strong puppies from pulling on the lead. These may be useful but should not be used as a substitute for training a puppy to walk without pulling.





Training

Reward good behaviour - ignore unwanted behaviour

Resting quietly

It is a good idea to give puppies praise and treats occasionally for lying quietly so that they learn that this is good behaviour. It can be useful to introduce a command such as 'settle' or 'bed' for times when the owner wants the puppy to remain quietly in one place.

Toilet training

One of the key things is to give a puppy lots of opportunities to go to the toilet in the right place. An owner should take him outside frequently, particularly after meals, after he has woken from a sleep, first thing in the morning and when the owner has been out. When he goes to the toilet in the right place he should be given lots of praise and a reward. A puppy should never be punished if he has an accident – it should simply be cleaned up as if nothing has happened. Accidents should be cleaned up with a non-ammonia based detergent (ammonia can smell like urine to dogs causing them to mark over it).

Behaviour problems

If a puppy develops behavioural problems it is best to speak to a veterinarian who can give him a health check and offer advice. A thorough health check by a veterinarian can sometimes reveal health problems that may be causing the behavioural issues. If appropriate, a veterinarian can refer the puppy to a behavioural specialist who can take a full and detailed history and then explain the motivation for the problem behaviour and help put together a treatment programme.

Using a crate

A puppy crate can be a great aid to training a puppy. However, the crate should be a nice, safe place for the puppy to rest in and should never be used as a punishment. It is important that a puppy crate is large enough for the puppy to stand up, lie down and turn around in easily when he is fully grown. Puppies should never be left in a crate for long periods of time. Owners who wish to use a crate for their puppy should begin by feeding the puppy in the crate so that he associates being in it with enjoyable experiences.

Other things to train

Puppy training classes are a great place for owners to learn to teach other tasks to their puppy. Useful commands to teach include 'stay', 'leave' and 'drop'. Puppy training classes can also help owners to teach tricks, such as rolling over or giving a paw, which can be a great way to keep an intelligent puppy's mind active.

Exercise

Exercise for healthy growth

Dogs are intelligent animals that require mental stimulation. Exercise is a good way of fulfilling this need, and is important for all puppies but particularly for highly active or working breeds. It is, however, recommended that the amount of exercise a puppy receives should be controlled whilst they are growing to minimise the risk of developing joint problems.

Controlling the amount of exercise is particularly important in large breed puppies as they take longer to stop growing and reach maturity and they more commonly suffer from joint problems such as elbow and hip dysplasia. There is growing evidence that breeds that are predisposed to these conditions may be less at risk of developing problems if their exercise is restricted rather than being given unlimited exercise.

There are no specific guidelines for how much exercise should be given, but the best advice is that a growing puppy should not be given 'forced exercise'. 'Forced exercise' is usually defined as 'exercise that is beyond what a puppy would engage in with a dog of the same age'. Most large or giant breed puppies will stop growing between 12-18 months old and it is, therefore, best to wait until this age before giving free ('forced') exercise, in order to help minimise problems in the future.





Health care

Role of the veterinarian

Throughout his life a dog will need regular veterinary care and attention. Before getting a new puppy, owners should consult with a veterinarian to ensure they have a healthcare programme in place.

Vaccination

Vaccines are pharmaceutical products that are designed to improve an animal's immunity against infection. They work by stimulating the body's immune system so that when exposed to the same infection the immune system can more rapidly recognise and react to it. It is recommended that all dogs should be given a set of core vaccines, which are Distemper, Adenovirus, Parvovirus and (in endemic areas) Rabies. Depending upon their geographical location or lifestyle a series of non-core vaccinations may be required. Vaccination not only provides protection to the individual animal but also helps to protect the entire population and minimise the chances of a major outbreak of any infectious disease¹⁶.

Parasite control

Dogs are susceptible to a number of different parasites, including worms, ticks, fleas and heartworms, which may be encountered during their normal day to day life. These not only pose a risk to the infected animal but certain parasites can infect humans as well. The type of parasites that a dog may be exposed to will depend upon where they live and their lifestyle and this will affect the type and frequency of treatment required. A wide variety of products are available for the treatment and prevention of parasites, including flea collars, spot-on or sprays, worming tablets and injections. Prevention and treatment plans should be discussed with a veterinarian to ensure that a dog receives the correct protection.

Neutering

Neutering is the surgical sterilisation of an animal through the removal of all or part of its reproductive organs. The primary reason for neutering is to prevent unplanned pregnancies. There are, however, other benefits associated with neutering such as reduced risk of certain cancers and potentially modifying unwanted behaviours associated with sex hormones. Behaviour problems, such as aggression, however, are rarely solved solely by neutering and are best addressed through a behaviour programme designed by a behaviourist or veterinarian. Owners are recommended to discuss the best age to neuter their puppy with a veterinarian.

Veterinary insurance

In many countries owners may be able to take out pet insurance, which covers unforeseen expenses such as veterinary fees and third party liability. This can be highly beneficial when facing expensive veterinary fees in unforeseen circumstances such as accidents or illness.





Oral care

Establishing a routine

Puppies have a set of deciduous ('milk') teeth that begin to erupt at around 3-4 weeks of age and most puppies have a full set of milk teeth by 7 weeks. Between 14 and 20 weeks of age, puppies lose their first set of teeth and the adult teeth begin to emerge. Teething triggers an urge to chew or gnaw so it is essential to provide some chewing toys to help prevent the puppy from chewing inappropriate objects and damaging their teeth. It is not advisable to feed bones to puppies or adult dogs as they pose a risk of tooth damage and splinters of bone may damage the digestive tract. A full set of adult teeth should be present by 7 months. If the entire set of adult teeth is not present by this stage, it is best to ask a veterinarian to monitor progress¹⁷.

Introducing the puppy to an oral health routine as early as possible will allow this habit to extend throughout their adult life, reducing their chance of developing gum disease or the more severe form known as periodontitis (periodontal disease). Periodontal disease is widespread in dogs and can cause pain, tooth loss and can potentially lead to problems in the rest of the body such as the heart and liver. Plaque build up is the trigger for periodontal disease, so it is important that a puppy is introduced to some form of regular plaque control as early as possible to ensure acceptance.

When they acquire a puppy, owners should make a point of putting their finger in the puppy's mouth and rubbing the gums and teeth gently on a daily basis. When the puppy is happy to accept this, they should be introduced to finger brushing. This technique involves using a commercially available finger brush and gently rubbing the outside surfaces of the teeth to remove plaque. When the puppy has finished teething, tooth brushing may be introduced. This may be carried out with or without a veterinary toothpaste and should be carried out daily for maximum effect. It is not recommended to use a human toothpaste as it contains fluoride and foaming agents which can cause stomach upsets when swallowed. Owners may supplement tooth brushing with specially designed puppy oral care treats which also help with plaque control. If owners need any advice on tooth brushing or any aspect of puppy oral care, it is best to speak to their veterinarian.





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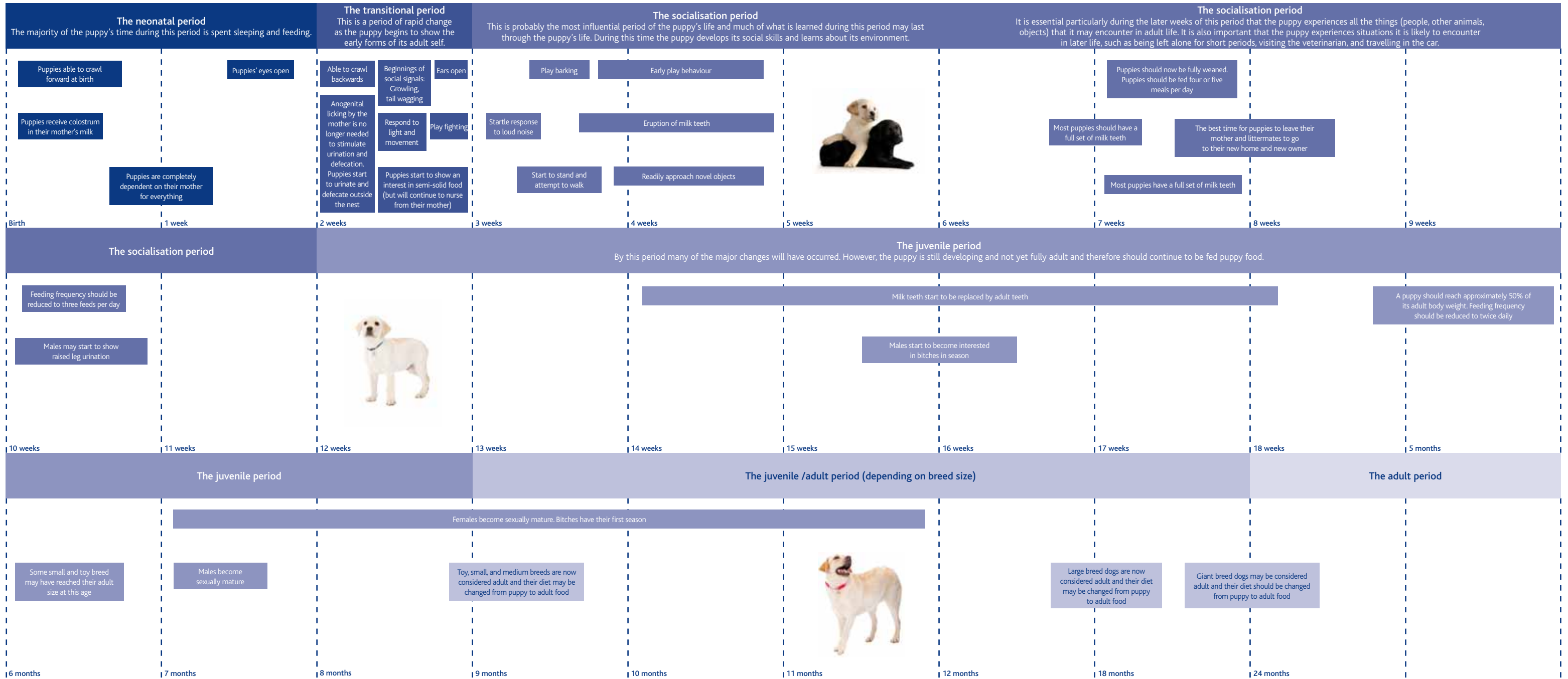




Top tips for puppy owners

Choosing a puppy	When choosing a new puppy owners should select a breed or type of dog that is appropriate for their lifestyle.
Diet	Puppies should be fed a complete and balanced diet designed for puppies until they are adult. The age they are adult differs according to breed size.
Socialisation	Puppies should encounter a variety of different people, dogs, objects and situations – all in a positive way. The most important time for this to occur is between three and 12 weeks of age, but socialisation should continue throughout a puppy's development. Puppy classes provide a good opportunity to socialise puppies.
Training	The best way to train is to reward good behaviour and ignore unwanted behaviour. It is never too early to begin training a puppy but owners must remember that very young puppies become tired or distracted easily so training sessions should be kept to a short duration.
Healthcare	Owners should discuss vaccinations, parasite control and neutering with their veterinarian, as well as any other concerns they may have.
Oral care	Owners should introduce some form of oral care for their puppy as early as possible.
Exercise	Amounts of exercise should be controlled for puppies during growth. Puppies should not be forced to exercise beyond the amount they would engage in with another puppy of the same age and must be allowed to rest when they need to.
Water	Fresh drinking water should always be provided for puppies in a bowl that is appropriate for their size.







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