ROYAL CANIN®
KNOWLEDGE AND RESPECT

The English Bulldog

Best balance of nutrients for Bulldogs

Royal Canin Scientific Research: innovation in Health Nutrition

English Bulldog: a unique animal

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The brave and powerful English Bulldog is both a good guard and an affectionate companion, and it's very gentle with the children. In a word - the Bulldog is a unique animal.

Royal Canin took the next step: the in-depth study of selected breeds showed the particular sensitivities that go well beyond size alone. A fully-grown English Bulldog weighs around the same as a Collie or a Siberian Husky, but who would be so audacious as to say they are not all alike?

- *The variation between the brachycephalic Bulldog and the dolichocephalic Collie forces us to adapt the way the food is presented. Our aim has been to conceive a kibble that the dog can prehend easily; a kibble that it can eat without any problem.*

- *The English Bulldog is famed for calmness and adapting well to life indoors. That's something that needs to be reflected in the energy content of its food, so that it is able to maintain the weight needed to stay healthy.*

It is only by leveraging the unrivaled expertise of breeders and the foremost specialists across the world that Royal Canin has been able to develop ***Bulldog 24*** *to meet the needs of an exceptional dog. The objective of this brochure is to show just how concerned Royal Canin is about a personalized nutritional approach.*

We want to offer the most accurate nutritional response possible to the needs of each and every dog, to guarantee it enjoys a long, healthy life. Today, our foods don't just nourish the dog, by covering basic needs. They play a role in preventing potential health risks from developing.

A unique food for a unique dog: ***Bulldog 24*** *is the best Health Nutrition answer for this exceptional companion.*

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THE BULLDOG...
A unique animal

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- *limiting the risk of obesity through a moderated fat content*
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- *reinforcing the effectiveness of the skin barrier*
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The history of the Bulldog...

From bullring to sidewalk

The Bulldog was originally specialized in bull baiting. Its task was to seize the bull by the nose and not let go. The first account of bull baiting comes from the town of Stamford in twelfth century England where bulls were chased across town by local butcher's dogs.

The foundations of the breed's morphological selection go back to this time: a short, wide nose that allows the dog to breathe without having to let go of its prey, wrinkles around its neck to protect its vital organs, squat, solid limbs to provide stability and keep the dog out of the way of the bull's horns.

Bull baiting was so widespread that every town had its own bullring, where fights would be staged. But as the centuries wore on, opposition to this cruel practice grew however and the British Parliament finally banned animal fights in 1835. An underground circuit continued to exist, but the gradual reduction in numbers of the Bulldog did not lead to its total extinction.

Fortunately, some members of the British dog-fancy community were unwilling to lose a dog with such qualities that had become the country's emblematic breed. Many breeders promoted the renaissance of the Bulldog, selecting specimens with a good character, while bringing out the dog's musculature even more. A number of breeds were crossed with the Bulldog to create new breeds like the Bullmastiff and the Bull Terrier.

The Bulldog has a central place in modern dog-fancy. Its standard was the first to be published back in 1876, on the initiative of the Bulldog Club, which was established in March 1875.

In the meantime the Bulldog has become a sheep in wolf's clothing: gruff and muscular on the outside, but gentle and friendly on the outside.

Its balanced character, sociability and attachment to its human companion have become some of its foremost traits. The Bulldog is highly affectionate with every member of the family, especially children. The bulldog is loving at heart, although its brooding demeanor can intimidate strangers.

The Bulldog can discourage intruders and has a good guarding instinct, but it's not a natural watchdog. However, it is very alert to everything that goes on around it and dominant over other dogs, even on their territory. It is a sturdy character and is headstrong. If it feels that it has been unjustly punished, it is capable of sulking for days on end. It needs to be trained very young, so as to understand the meaning of the word "no" as early as possible. The more experiences it has, the fewer quarrels it is likely to pick.

The Bulldog's popularity continues to increase and the explosion in demand has led to a doubling of the number of births in the past five years.

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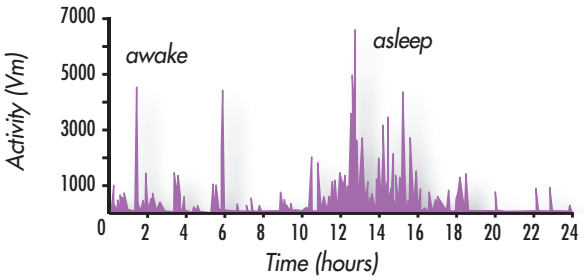
1 A calm dog that cannot bear prolonged exercise or heat

The Bulldog is naturally very calm. Its gruff exterior hides a gentle, friendly character. It isn't very active, happily spending its days dozing.

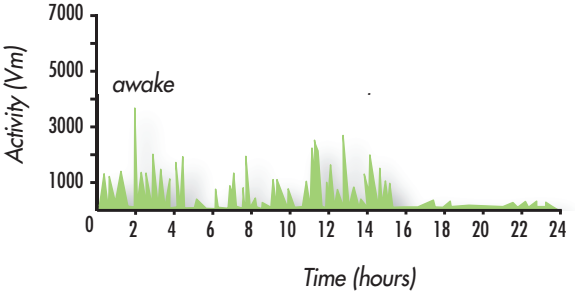
Comparison of spontaneous activity in the Bulldog and the Boxer

Boxer



Input obtained through continuous recording by an accelerometer fixed to the dog's collar. The accelerometer uses a piezoelectric system to record the accumulated movements of the dog on three axes and transcribe them into a vector magnitude.

Bulldog



In similar environmental conditions (alone during the day), the Bulldog's overall spontaneous activity is only 60% of the Boxer's. This lower degree of activity is especially apparent when the human companion returns in the evening.

The Bulldog must be imposing, but should never be fat. Its squat, compact stature is highly characteristic. It's a large, powerful dog in spite of its weight, which puts it in the medium category. The AKC standard places the breed in the 51-55-pound bracket.

The Bulldog's ancestors used to bait bulls were the lightest, most agile specimens. Now a companion dog, its physical stature has developed greatly, and its gait too. The Bulldog walks with short, quick steps on tiptoe, not lifting its hind legs, which seem to skim the ground. When the dog runs, the shoulders are pushed well forward.

Average weight of an adult Bulldog

Internal Royal Canin Sources

	Male	Bitch
Number of dogs	51	56
Average age	25 months	31 months
Average weight	26.2 +/- 2.7 kg	22.5+/- 2.9 kg

Weights taken at shows in France reveal a dimorphism between the male and the less-imposing bitch.

The dog does need a minimum of activity if it is to avoid putting on weight. At least two walks a day are recommended, though not in hot periods, especially when the dog has to spend time in the car before starting its walk. This breed cannot bear the heat as a consequence of its very short upper respiratory tract, which means the air has less time to cool down and humidify *(Hendricks et al, 1993)*. On the other hand, the panting (or thermal polypnea) normally used by the dog to regulate internal temperature represents a major effort, because its air circulation is less straightforward than it is for other dogs. The Bulldog is drained by the effort of combating the heat, and heavy respiration is an outward sign of that.

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The Bulldog often suffers from apnea when it sleeps, which makes it a model for the study of sleep apnea in humans *(Veasey et al, 2001; Panckeri et al, 1996)*.

Its lack of stamina may also be due to problems with the neuro-vegetative nervous system *(Fabries, 2002)*.

PROTECTING THE HEART AND JOINTS

Objective #1: limiting the risk of obesity

The tendency to sleep a lot heightens the risk of obesity if a bulldog's weight is not monitored adequately. An imbalance can occur between low energy expenditure and excessive calorie intake.

Obese dogs are at greater risk of suffering from heat stroke when the ambient temperature rises *(Flournoy et al, 2003)*. If the dog is too heavy, its intolerance to effort and its respiratory problems are more marked *(De Rick & de Schepper, 1980)*. There is also a correlation with the incidence of tracheal collapse* and obesity *(White & Williams, 1994)*.

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To provide fewer calories without reducing the volume of the ration too severely, we have to limit the energy concentration by curbing the fat content. Fats provide twice as many calories as the same weight of carbohydrates or proteins. **BULLDOG 24** contains only 14% fat and provides fewer than 4000 kcal/kg.

Objective #2: preserving articular cartilage

The Bulldog is chondrodystrophic*, which means its cartilage ossifies prematurely. As a consequence, the limbs stop growing at an early age. The irregular position of the legs means its joints tend to tire faster than other breeds, especially when it is overweight. The rupture of the cruciate ligaments is a rather regular complaint among Bulldogs *(Veterinary Medical Data Base 1981-2001)*.

Chondroitin sulfate is a constituent of cartilage and the synovial fluid that helps lubricate the joint. Its incorporation in the food curbs the action of the enzymes that destroy cartilage. It has a strong water-retaining capacity, which facilitates good cartilage hydration.

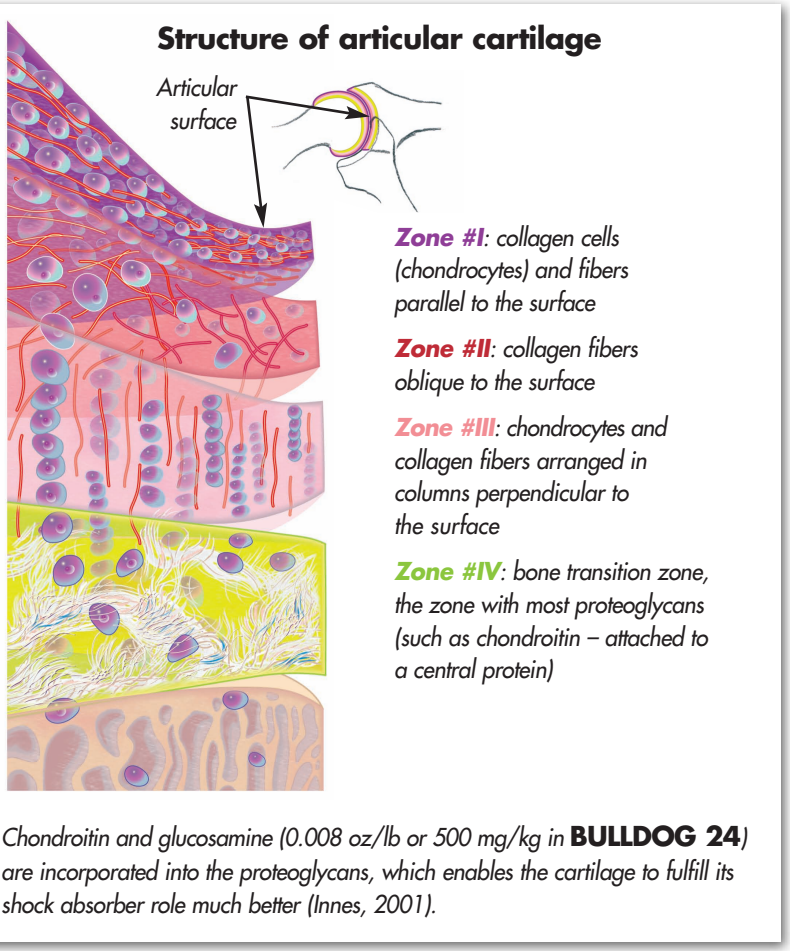
*See glossary on p. 30

Glucosamine (a precursor of the main constituents of articular cartilage) stimulates cartilage regeneration, particularly by promoting the synthesis of collagen.

Omega 3 fatty acids (EPA and DHA) * extracted from fish oil have an anti-inflammatory action that promotes the health of the joints *(Innes, 2001)*. **BULLDOG 24** contains 0.4% omega 3 fatty acids.

Objective #3: combating oxidative stress

Due to its peculiar respiration, the oxygenation of the cells may leave something to be desired, inducing certain tissue lesions as well as the increased production of free radicals. The incorporation of antioxidants in the food is one of the recommended ways to combat oxidative stress, especially in the heart. The main antioxidants in **BULLDOG 24** are:



Chondroitin and glucosamine (0.008 oz/lb or 500 mg/kg in **BULLDOG 24***) are incorporated into the proteoglycans, which enables the cartilage to fulfill its shock absorber role much better (Innes, 2001).*

- **vitamin E**: dogs suffering from heart failure produce more oxidants and have lower levels of vitamin E *(Freeman et al, 1999)*,
- **vitamin C**: its presence, optional in dogs, maximizes the potential of the effect of vitamin E,
- **lutein** protects the lipid membranes from potential damage caused by oxidative stress,
- **green tea polyphenols**: there is an inverse relationship between the intake of dietary flavonoids* and cardiovascular diseases *(Urquiaga & Leighton, 1999)*,
- **taurine***: as well as its effect on cardiac contractility, it has antioxidant properties.

*See glossary on p. 30

2 Respiration and digestion: two systems that are intimately linked

While the respiratory peculiarities of the Bulldog are well known (snoring, intolerance to effort and heat), the digestive signs often associated with it are less well discussed: very frequent deglutition, vomiting when the dog is excited, rumbling in the bowels, and flatulence.

Brachycephalic* dogs have particular anatomical traits that may lead to a reduction in the passage of air through the airways. These include:

- constriction (stenosis) of the nostrils due to the wrinkled skin around the nose,
- very thick tongue,
- excessive length of the soft palate compared to the pharyngeal cavity, creating turbulences in the passage of air,
- reduction in the diameter of the tracheal rings (or hypoplasia of the trachea).

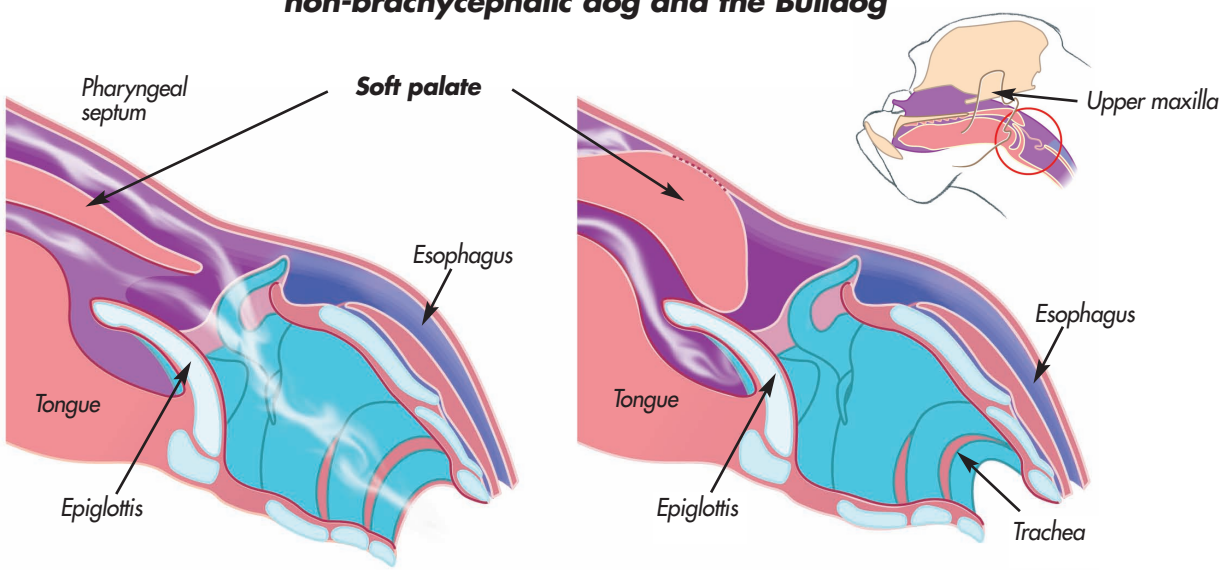
The efforts that the dog is forced to expend to inhale are clearly responsible for abdominal compressions that may lead to modifications in digestive transit in the long term. These include:

- frequent gastroesophageal reflux, augmenting the risk of esophagitis accompanied by regurgitation and perhaps aspiratory pneumonia in the most severe cases *(Lorinson & Bright, 1998)*. Regurgitations are facilitated by two characteristics of the Bulldog: the esophagus is slightly sinuous rather than straight, and the cardia (the sphincter at the entrance to the stomach) is often atonal;
- an abnormally long retention of gastric content, possibly promoting the appearance of gastritis.

The stenosis of the pylorus is rather common. This characteristic can disturb the normal emptying of the stomach.

*See glossary on p. 30

Comparison of the anatomy of the upper airways of a non-brachycephalic dog and the Bulldog



The caudal extremity of the soft palate is very narrow in a non-brachycephalic dog, providing a large opening through which air can pass. The Bulldog's soft palate is much wider and extends farther back. The tongue is thicker and the trachea narrower, which reduces the diameter of the airways.

These digestive lesions can be identified during an endoscopic examination, even in the absence of clinical signs *(Dupré & Freiche, 2002)*.

75% of brachycephalic dogs suffering from respiratory disorders present mild to severe digestive lesions *(Poncet et al, 2002)*. Surgery on the nostrils or the soft palate may lead to a sustained improvement in respiratory and digestive complaints *(Dupré & Freiche, 2002)*.

When surgery is associated to a medical treatment, digestive disorders tend to disappear within a few months *(Freich, personal communication, 2004)*.

IMPROVING DIGESTION TO LIMIT FERMENTATION

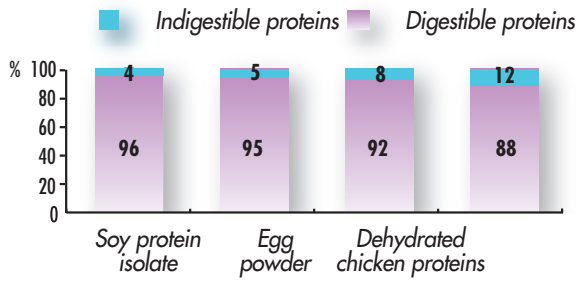
The selection of protein and starch sources has a decisive impact on digestive tolerance.

Objective #1: minimizing the quantity of indigestible proteins

The use of highly digestible proteins of high biological quality limits the quantity of substrate available to the colon's bacteria populations*. An influx of indigestible proteins may disturb the flora and reorient its profile into potentially pathogenic strains *(Zentek et al, 1998)*. Protein fermentation generates gas (flatulence) and molecules that impart the stools with a pungent odor that can also have a toxic effect on the colon mucosa *(Rowland, 1999)*. Lastly, the increase in the bacteria biomass tends to increase the quantity and the water content of stools, while degrading their quality *(Martineau et al, 2000)*.

Digestibility of main sources of protein in BULLDOG 24

Source: Royal Canin



Results obtained through in vitro enzyme tests, showing a good correlation with the values obtained on the animal.

It is often wrongly supposed that vegetable proteins are very inferior to animal proteins. In fact, it's simply a case of eliminating the fiber matrix to reduce the accessibility of vegetable proteins for the digestives enzymes. A choice of raw ingredients and a mastery of the production process makes it possible to achieve a level of protein indigestibility with vegetable proteins that is often lower than that of animal proteins.

BULLDOG 24 uses the best protein sources available: with only 2% indigestible proteins, **BULLDOG 24** improves protein digestibility by 30% compared with a traditional food, which has immediate visible consequences on the quality of stools.

*See glossary on p. 30

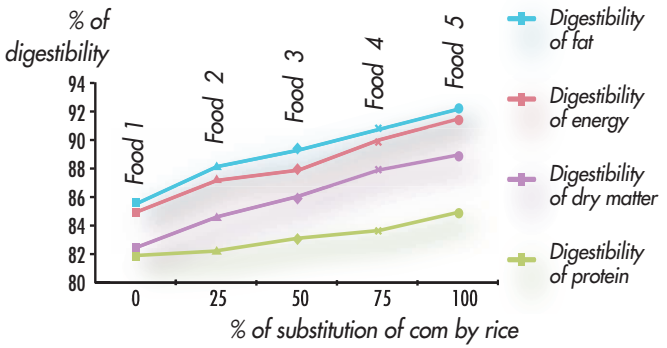
Objective #2: incorporating rice as the only source of starch

When it is poorly digested, cereal starch becomes a highly fermentable substrate for the intestinal flora. The degradation products include lactic acid, which is not very well absorbed by the intestinal mucosa and is highly osmotic, which promotes the creation of wet stools.

Of the various cereals used in dog food, rice is the most digestible *(Mathews et al, 1999)*. Better tolerance is due to several characteristics: its dietary fiber content is lower than other cereals (< 2%), it is not very osmotic and it possesses a highly accessible structure for digestive enzymes. The starch is much more digestible when prepared correctly.

Influence of rice on overall digestibility

From Belay et al, 1997



When rice is the only source of starch (food 5), overall digestibility is better than it is for an isoenergetic diet based on intact corn only (food 1).

Rice helps realize a reduction in feces volume. It also improves digestibility of dry matter compared with an isoenergetic diet based on corn.

Objective #3: guaranteeing a balance between fermentable and non-fermentable fibers

Dietary fibers play an important role in digestive transit and tolerance.

- Non-fermentable fibers are found almost intact in the stools: they trap the water and promote the production of solid stools.
- Fermentable fibers (like fructo-oligosaccharides) are degraded by the microflora and provide the energy the beneficial colon flora and mucus cells need to regenerate.

For a breed like the Bulldog, whose fermentation activity is naturally high, it is essential to associate rapidly degraded fibers (FOS) with fibers that degrade more slowly (beet pulp) to maintain a properly functioning colon ecosystem, while producing stools of good quality *(Silvio et al, 2000)*.

3 A severely brachycephalic type

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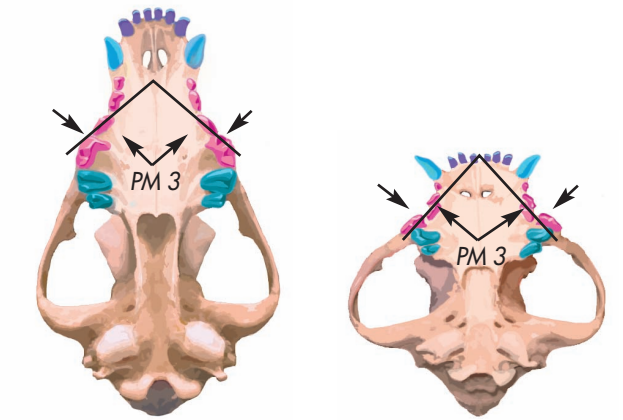
The Bulldog's very short face has led to the shortening of the upper jaw, preventing it from using its incisors in a scissors action to grab its food.

The Bulldog is a perfect brachycephalic specimen, with a short face and muzzle. The head is practically as wide as it is long. The Bulldog has powerful jaws with a highly particular conformation: the lower jaw juts out in front of the upper jaw, curving upwards. Much is made of the prognathous character of the breed, but the term retrognathism is preferable, as selection has favored dogs whose upper jaw is shorter than their lower jaw.

In dogs with elongated heads, the two dental arches are superimposed like shear blades, with the lower arch always a few millimeters behind the upper arch.

The shortening of the Bulldog's face leads to a particular type of tooth implantation in the upper jaw. The premolars tend to position themselves transversally, which poses clear problems in terms of occlusion and food prehension. In the absence of incisor approximation, the dog is obliged to use its tongue or its lateral teeth to grip its kibbles. There is always a risk of suffocation when the dog eats too fast.

Tooth implantation on the upper jaw of the German Shepherd and the English Bulldog respectively

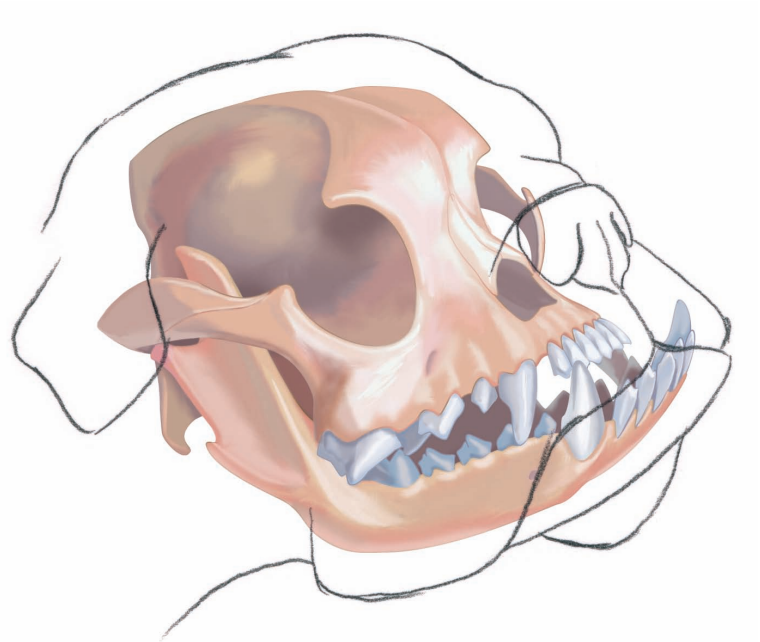


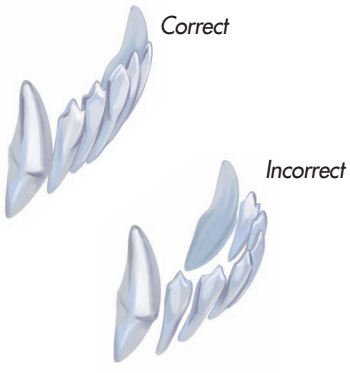
Upper maxilla of the German Shepherd *Upper maxilla of the Bulldog*

Its prognathous character has gradually provoked the repositioning and rotation of the Bulldog's third and fourth premolars, which makes occlusion and food mastication more difficult.

*See glossary on p. 30

Skull of a Bulldog





The Bulldog's incisors are implanted in a straight line. From the 2003 Bulldog standard (The Bulldog Breed Council)

Like all dogs, the Bulldog is threatened by periodontal disease*, which is caused by the bacteria in the dental plaque attacking the tooth supporting tissue. But many people hesitate to take their dogs to the veterinarian for regular periodontal scaling because of the risk the anesthetic poses for a dog whose cardio-respiratory function is fragile.

Brachycephalic breeds are more likely to display another anomaly at birth: cleft lip or cleft palate due to the non-fusion of the nasal and maxillary arches during embryonal development. This very serious fault often results in euthanasia due to the risk of aspiratory pneumonia caused by the passage of food into the nasal cavities. A deficiency of folic acid plays a major role in the appearance of cleft lips and cleft palates in humans and dogs.

*See glossary on p. 30

A KIBBLE SPECIALLY ADAPTED TO THE JAWS AND DENTITION OF THE BULLDOG

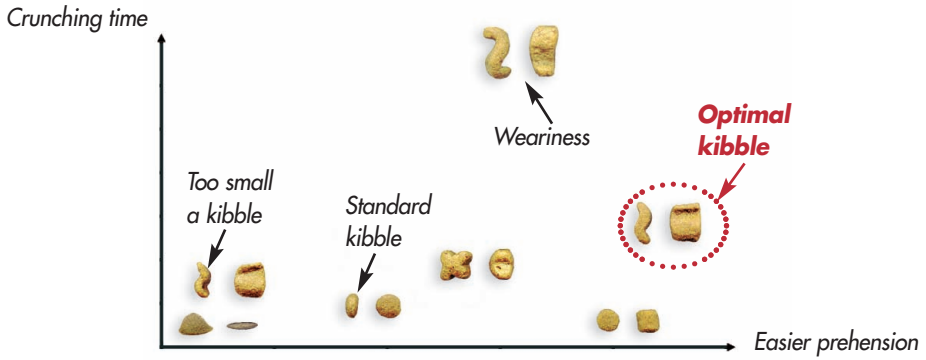
The ergonomics and the texture of the kibble have been studied on the basis of the Bulldog's particular dentition and jaws.

Objective #1: facilitating prehension

The dietary behavior of 26 Bulldogs was observed using ten different kibble shapes. Closed circuit TV was used to record the dogs from below the eating surface. The wave-shaped kibble selected satisfies three major objectives:

- The dog finds it easy to grip
- It doesn't roll about in the bowl
- It minimizes crumbling and powdering to prevent incorrect deglutition, which can lead to aspiration pneumonia.

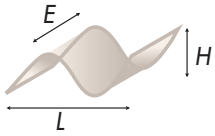
Influence of the kibble's shape and size on food consumption (study on 26 Bulldogs)



Objective #2: encouraging the dog to chew

If the dog chews, the kibble exercises a light abrasive effect on the teeth that helps disorganize the bacteria biofilm of the dental plaque. The shape of the **BULLDOG 24** kibble encourages the dog to chew, which realizes this mechanical effect. Its size and volume were determined only after the risks of constriction or long-term weariness were mapped. Its supple texture encourages salivation, which has a natural cleaning effect on the crown of the tooth.

Kibble
BULLDOG 24



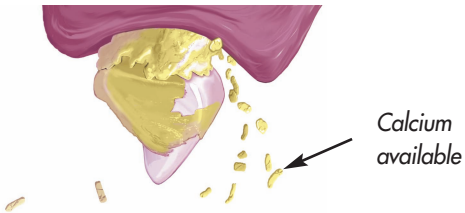
Objective #3: slowing down dental plaque mineralization

BULLDOG 24 contains sodium tripolyphosphate, which acts as a chelating sodium agent on the calcium in the saliva. This compound is also used in many toothpastes *(Sowinski et al, 1998)*. Calcium ion (Ca++) takes the place of two sodium ions (Na+), which thus becomes unavailable for the formation of tartar. The calcium is then released and metabolized normally in the process of digestion.

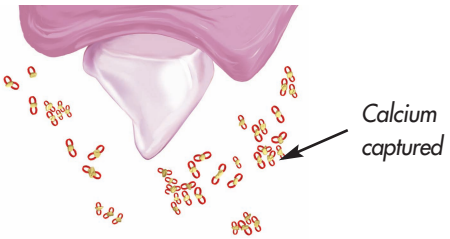
Objective #4: preventing folic acid deficiency to combat the risk of cleft palates

A study on the Boston Terrier shows that a supplement of folic acid (5 mg/day/dog) during pregnancy reduces the risk of a cleft palate by 76% *(Elwood & Colqhhoun, 1997)*. **BULLDOG 24** contains a high level of folic acid, which is approximately ten times the amount found in a traditional food.

Action of sodium tripolyphosphate



Without sodium tripolyphosphate



With sodium tripolyphosphate

Sodium tripolyphosphate limits the quantity of salivary calcium available to form tartar and contributes to good oral hygiene.

5 Wrinkled skin that's highly sensitive to infection

Skin complaints (including otitis externa) were found to affect 35% of all dogs visiting a veterinarian and were the most common cause of a consultation among Bulldogs between twelve months and 4 years *(Veterinary Medical Data Base, 1981-2001)*.

The Bulldog's loose, wrinkled skin explains this predisposition: the folds of the skin trap humidity and heat, creating a favorable environment for bacterial (folliculitis or bacterial furunculosis), fungal (*Malassezia dermatitis*) or parasite (demodetic mange) infections *(Scott et al, 2001)*. These skin folds also slow the healing of wounds.

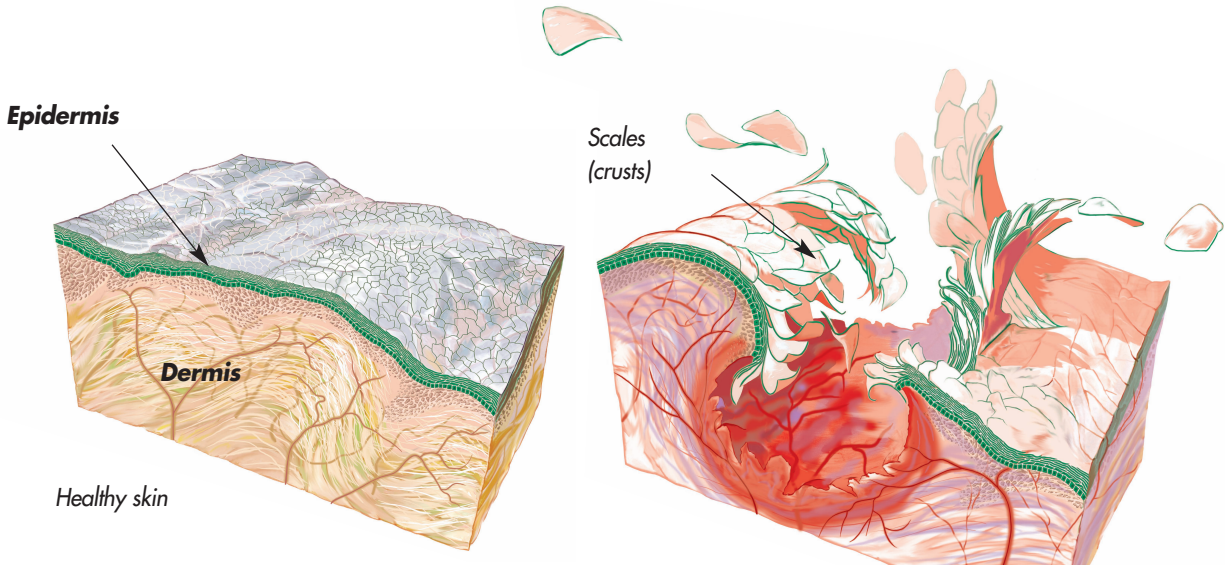
The depth of the folds above the muzzle varies between 0.2 inches and an inch; they measure between 1.2 inches and 4.3 inches across. To limit the risk of infection, the folds and the ears must be cleaned every day. An emolliating shampoo should be used once a week.

The Bulldog is also predisposed to atopy *(Willemse, 2000)*, which is the second most common skin disease affecting dogs, after hypersensitivity to flea bites.

The degree of pruritus caused by skin irritations varies according to the time of year. If the pruritus is severe, it may provoke lesions in between the digits, inside the ears and auditory canal, on the abdomen, on the face, and on the neck.

More than 55% of atopic dogs exhibit otitis *(Harvey & Mc Keever, 2000)*, which is a warning sign in 45% of cases *(Willemse, 2000)*.

Reaction of the epidermis during acute pruritus



In the event of pruritus, scratching damages the epidermis, which reduces its barrier function. Skin under attack is unable to limit water loss. This facilitates penetration by allergens and infectious agents.

*See glossary on p. 30

HELPING THE SKIN DEFEND ITSELF AGAINST EXTERNAL ATTACKS

In atopic dogs the skin barrier does not contain sufficient lipidic lamellae (ceramides*) between the cells. This deficiency in "natural cement" means that the skin does not carry out its protective tasks correctly, which facilitates penetration by allergens *(Inman et al, 2001)*.

Objective #1: reinforcing the effectiveness of the skin barrier

27 substances that can have a beneficial effect on the skin barrier function were analyzed meticulously at the Waltham Center for Pet Nutrition. The selection criteria were based on limiting water loss through the epidermis and synthesizing skin lipids.

- **Pantothenic acid** is involved as a coenzyme in many syntheses, including those of fatty acids.

- **Choline and inositol** work in tandem and play a role in the generation of cell membranes. Choline forms phospholipids in combination with phosphorus.

- **Niacin** (or nicotinamide) is synthesized from tryptophan. It is essential to cellular respiration. In case of deficiency it provokes pruriginous dermatitis of the dog's abdomen and the hind limbs (it's called pellagra in humans).

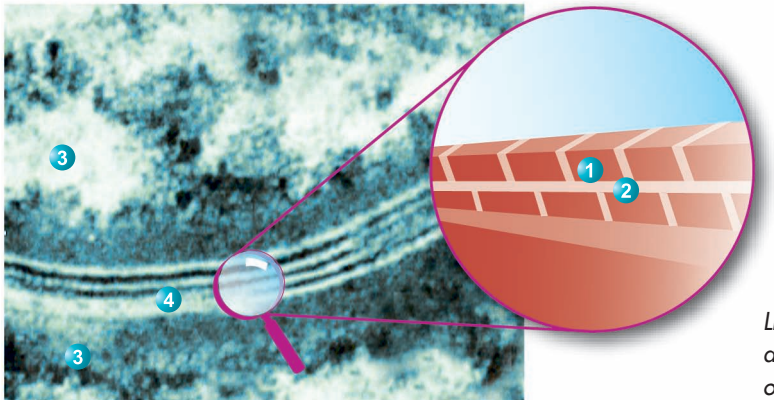
- **Histidine** is essential to the growth and maturation of epidermal cells, the keratinocytes.

Four group B vitamins and one amino acid* acting in synergy have been found to improve the skin barrier *(Watson et al, 2003a)*. Group B vitamins are water soluble; even used in a large dosage they are not stored in the body. In general, a balanced food and the synthesis realized by intestinal bacteria guarantee a sufficient intake. The intake can become marginal, however, due to major water loss or antibiotic treatments.

The beneficial effect of the administration of this complex of nutrients manifests itself after two months, due to the time needed for the differentiation process and the maturation of epidermal cells.

*See glossary on p. 30

Skin barrier



1 - Brick
2 - Cement
3 - Skin cell
4 - Ceramides (cutaneous lipids)

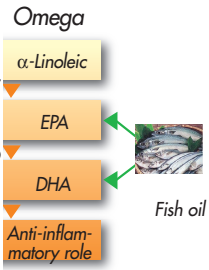
Like the cement that bonds the bricks of a wall, ceramides ensure the cohesion of skin cells.

Objective #2: controlling inflammation through essential fatty acids

Some fatty acids are said to be "essential" because the body is incapable of synthesizing them. In case of deficiency, the skin will display major desquamation and the skin barrier function will be altered *(Scott et al, 2001)*.

Essential fatty acids have a double function: they bring the composition of the superficial lipidic film back into balance to limit dry skin phenomena *(Watson et al, 2003b)*, while also slowing the synthesis of inflammatory mediators. The anti-inflammatory properties of long chain omega 3 fatty acids (EPA and DHA) are also widely used in human and veterinary dermatology *(Byrne et al, 2000)*. Their regular administration often permits the reduction of the medicine doses needed to relieve some skin irritations *(Prélaud, 1999)*.

A supply of unsaturated fatty acids



The direct intake of EPA and DHA helps compensate the

**See glossary on p. 30*

2-12 months

GROWTH PHASE

MEDIUM PUPPY 32

High nutrition, with everything the Bulldog puppy needs to grow into the perfect dog

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IMMUNITY BOOSTER
CONSTRUCTION DES DÉFENSES NATURELLES
•
BUILDING NATURAL DEFENSES

Concentration of the energy and nutrients essential to meet the demanding requirements of growth

Reinforced digestive security: protecting the intestinal mucosa, ensuring flora equilibrium and regular digestive transit

The right balance of calcium and phosphorus for proper bone mineralization

FROM 12 months

ADULT AND MATURE PHASES

MEDIUM BULLDOG 24

Best balanced nutritional food exclusively formulated for the Bulldog

TARTAR REDUCTION
HYGIÈNE BUCCO-DENTAIRE • DENTAL HYGIENE

Contributes to maintaining good oral hygiene

ODOR RELIEF
ODOR CONTROL
CONTROLE DES ODEURS

Minimizes the quantity of undigested residues to limit intestinal fermentations

SPECIAL KIBBLE SHAPE
FORME DE CROQUETTE SPECIALE

Carefully designed shape and texture facilitates prehension and encourage the dog to chew

SKIN CONDITION
MEILLEURE SANTÉ DE LA PEAU

Reinforces the effectiveness of the skin barrier

The Bulldog from the tips of its toes

General Appearance

The perfect Bulldog must be of medium size and smooth coat; with heavy, thick-set, low-swung body, massive short-faced head, wide shoulders and sturdy limbs. The general appearance and attitude should suggest great stability, vigor and strength. The disposition should be equable and kind, resolute and courageous (not vicious or aggressive), and demeanor should be pacific and dignified. These attributes should be countenanced by the expression and behavior.

Size, Proportion, Symmetry

Size--The size for mature dogs is about 50 pounds; for mature bitches about 40 pounds. Proportion--The circumference of the skull in front of the ears should measure at least the height of the dog at the shoulders. Symmetry--The "points" should be well distributed and bear good relation one to the other, no feature being in such prominence from either excess or lack of quality that the animal appears deformed or ill-proportioned. Influence of Sex In comparison of specimens of different sex, due allowance should be made in favor of the bitches, which do not bear the characteristics of the breed to the same degree of perfection and grandeur as do the dogs.

Head

Eyes and Eyelids--The eyes, seen from the front, should be situated low down in the skull, as far from the ears as possible, and their corners should be in a straight line at right angles with the stop. They should be quite in front of the head, as wide apart as possible, provided their outer corners are within the outline of the cheeks when viewed from the front. They should be quite round in form, of moderate size, neither sunken nor bulging, and in color should be very dark. The lids should cover the white of the eyeball, when the dog is looking directly forward, and the lid should show no "haw." Ears--The ears should be set high in the head, the front inner edge of each ear joining the outline of the skull at the top back corner of skull, so as to place them as wide apart, and as high, and as far from the eyes as possible. In size they should be small and thin. The shape termed "rose ear" is the most desirable. The rose ear folds inward at its back lower edge, the upper front edge curving over, outward and backward, showing part of the inside of the burr. (The ears should not be carried erect or prick-eared or buttoned and should never be cropped.) Skull--The skull should be very large, and in circumference, in front of the ears, should measure at least the height of the dog at the shoulders. Viewed from the front, it should appear very high from the corner of the lower jaw to the apex of the skull, and also very broad and square. Viewed at the side, the head should appear very high, and very short from the point of the nose to occiput. The forehead should be flat (not rounded or domed), neither too prominent nor overhanging the face. Cheeks--The cheeks should be well rounded, protruding sideways and outward beyond the eyes. Stop--The temples or frontal bones should be very well defined, broad, square and high, causing a hollow or groove between the eyes. This indentation, or stop, should be both broad and deep and extend up the middle of the forehead, dividing the head vertically, being traceable to the top of the skull. Face and Muzzle--The face, measured from the front of the cheekbone to the tip of the nose, should be extremely short, the muzzle being very short, broad, turned upward and very deep from the corner of the eye to the corner of the mouth. Nose--The nose should be large, broad and black, its tip set back deeply between the eyes. The distance from bottom of stop, between the eyes, to the tip of nose should be as short as possible and not exceed the length from the tip of nose to the edge of underlip. The nostrils should be wide, large and black, with a well-defined line between them. Any nose other than black is objectionable and a brown or liver-colored nose shall disqualify. Lips--The chops or "flews" should be thick, broad, pendant and very deep, completely overhanging the lower jaw at each side. They join the underlip in front and almost or quite cover the teeth, which should be scarcely noticeable when the mouth is closed. Bite--Jaws--The jaws should be massive, very broad, square and "undershot," the lower jaw projecting considerably in front of the upper jaw and turning up. Teeth The teeth should be large and strong, with the canine teeth or tusks wide apart, and the six small teeth in front, between the canines, in an even, level row.

Neck, Topline, Body

Neck -- The neck should be short, very thick, deep and strong and well arched at the back. Topline -- There should

be a slight fall in the back, close behind the shoulders (its lowest part), whence the spine should rise to the loins (the top of which should be higher than the top of the shoulders), thence curving again more suddenly to the tail, forming an arch (a very distinctive feature of the breed), termed "roach back" or, more correctly, "wheel-back." Body--The brisket and body should be very capacious, with full sides, well-rounded ribs and very deep from the shoulders down to its lowest part, where it joins the chest. It should be well let down between the shoulders and forelegs, giving the dog a broad, low, short-legged appearance. Chest--The chest should be very broad, deep and full. Underline--The body should be well ribbed up behind with the belly tucked up and not rotund. Back and Loin--The back should be short and strong, very broad at the shoulders and comparatively narrow at the loins. Tail--The tail may be either straight or "screwed" (but never curved or curly), and in any case must be short, hung low, with decided downward carriage, thick root and fine tip. If straight, the tail should be cylindrical and of uniform taper. If "screwed," the bends or kinks should be well defined, and they may be abrupt and even knotty, but no portion of the member should be elevated above the base or root.

Forequarters

Shoulders--The shoulders should be muscular, very heavy, widespread and slanting outward, giving stability and great power. Forelegs--The forelegs should be short, very stout, straight and muscular, set wide apart, with well developed calves, presenting a bowed outline, but the bones of the legs should not be curved or bandy, nor the feet brought too close together. Elbows--The elbows should be low and stand well out and loose from the body. Feet-- The feet should be moderate in size, compact and firmly set. Toes compact, well split up, with high knuckles and very short stubby nails. The front feet may be straight or slightly out-turned.

Hindquarters

Legs--The hind legs should be strong and muscular and longer than the forelegs, so as to elevate the loins above the shoulders. Hocks should be slightly bent and well let down, so as to give length and strength from the loins to hock. The lower leg should be short, straight and strong, with the stifles turned slightly outward and away from the body. The hocks are thereby made to approach each other, and the hind feet to turn outward. Feet--The feet should be moderate in size, compact and firmly set. Toes compact, well split up, with high knuckles and short stubby nails. The hind feet should be pointed well outward.

Coat and Skin

Coat--The coat should be straight, short, flat, close, of fine texture, smooth and glossy. (No fringe, feather or curl.) Skin--The skin should be soft and loose, especially at the head, neck and shoulders. Wrinkles and Dewlap--The head and face should be covered with heavy wrinkles, and at the throat, from jaw to chest, there should be two loose pendulous folds, forming the dewlap.

Color of Coat

The color of coat should be uniform, pure of its kind and brilliant. The various colors found in the breed are to be preferred in the following order: (1) red brindle, (2) all other brindles, (3) solid white, (4) solid red, fawn or fallow, (5) piebald, (6) inferior qualities of all the foregoing. Note: A perfect piebald is preferable to a muddy brindle or defective solid color. Solid black is very undesirable, but not so objectionable if occurring to a moderate degree in piebald patches. The brindles to be perfect should have a fine, even and equal distribution of the composite colors. In brindles and solid colors a small white patch on the chest is not considered detrimental. In piebalds the color patches should be well defined, of pure color and symmetrically distributed.

Gait

The style and carriage are peculiar, his gait being a loose-jointed, shuffling, sidewise motion, giving the characteristic "roll." The action must, however, be unrestrained, free and vigorous.

Temperament

The disposition should be equable and kind, resolute and courageous (not vicious or aggressive), and demeanor should be pacific and dignified. These attributes should be countenanced by the expression and behavior.

www.akc.org/breeds/bulldog/

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Scientific Glossary

Amino acid: nitrogen-bearing molecules that are the building blocks of proteins. There are 22 amino acids, 10 of which are essential and so must be present in the dog's food.

Atopy: the immune system's tendency to react excessively to the presence of allergens, such as house dust mites and pollen.

Brachycephalic: Greek for 'short-headed'. Brachycephalic dogs (including Boxers, Shih Tzus and Pekingese) have a squashed face with a very flat muzzle viewed in profile. This conformation is accompanied by a shortening of the upper airways resulting in often noisy breathing.

Ceramides: skin lipids necessary for the integrity of the outer layer of the epidermis.

Chondrodystrophia: hereditary disease (suffered by the Dachshund, Basset Hound and Pekingese, among others) that causes deformed and shortened leg bones.

Colon: middle section of the large intestine between the cecum and the rectum. The section of the intestine with the highest concentration of bacteria, containing 1010-1011 bacteria/g compared with 'only' 105-109 /g in the small intestine.

Flavonoids: principle family of polyphenols found in abundant quantities in plants. Catechin and epicatechin are especially active flavonoid molecules found in green tea and grapes.

Omega 3 fatty acids: fatty acids possessing an anti-inflammatory capacity widely used in dermatology. The most important are long-chain fatty acids (EPA and DHA), which are abundant in fish oils.

Omega 6 fatty acids: unsaturated fatty acids essential to cell membrane regeneration. They include linoleic acid, which is abundant in vegetable oils.

Periodontal disease: attack on tooth supporting tissue by bacteria in dental plaque.

Prognathism: modification in the relative length of the jaws. Called underhung jaw, or underbite when the upper jaw is less prominent than the lower jaw.

Taurine: sulfur amino acid, a major constituent of immune cells, concentrated in the retina and the heart. Also possesses antioxidant powers.

Tracheal collapse: weakening of the tracheal rings leading to a dry, nagging cough.

A history of innovation at Royal Canin

A history of commitment to developing knowledge and respect for the needs of small, medium and large breeds.

1967: Launch of ROYAL CANIN by a veterinarian

1980: Launch of the first growth food for large breed puppies (AGR)

1988: Launch of the veterinary ranges

1990: Launch of the first diets to respond to the diversity of dog size (RCCI)

1997: Launch of the Size Nutrition program based on the dog's age, activity, and size

1999: Launch of:
- Starter, a unique kibble based weaning diet for dogs
- A sporting dog diet (Energy 4800)
- A veterinary diet for the nutritional management of osteoarthritis in dogs (Mobility Support JS 21)

2001: Launch of a diet for giant breed dogs (Giant Adult)

2003: Launch of:
- Foods just for small breed dogs (MINI Canine Health Nutrition) and Yorkshire Terriers (MINI Yorkshire 28)
- Foods just for large breed dogs (MAXI Canine Health Nutrition) and breed specific foods (MAXI Labrador Retriever 30 and MAXI German Shepherd 24)
- Eight formulas dedicated for Professional Canine Breeders (Canine PRO)

2004: Launch of:
- Foods for medium breed dogs (MEDIUM Canine Health Nutrition) including Bulldogs (MEDIUM Bulldog 24)
- Small breed specific foods (MINI Chihuahua 28 and MINI Poodle 30)
- Food for very young large breed puppies (MAXI Babydog 30)
- The first full line of therapeutic diets to help manage allergic skin disease including canine atopy (Limited Ingredient Diets, Hypoallergenic and Skin Support formulas)

2005: Launch of:
- Small breed specific foods (MINI Dachshund 28 and MINI Shih Tzu 24)
- Food for Boxers (MAXI Boxer 26)
- A specialized formula, HT42d, for the reproductive bitch
- The first veterinary diet for the nutritional management of osteoarthritis specifically for large breed dogs (Mobility Support JS 21 Large Breed)

2006: Launch of small breed foods (MINI Beauty 26, MINI Indoor Adult 21 and MINI Dental Hygiene 24)

2007: Launch of:
- MINI Indoor Toy Adult 27
- MINI Indoor Puppy 27
- MINI Miniature Schnauzer 25

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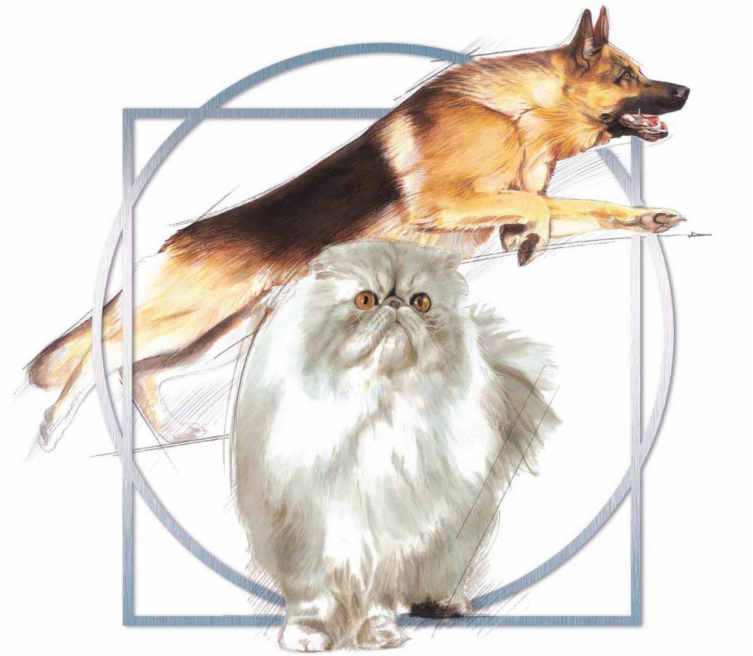

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