

Calcium Supplementation

Introduction

Dogs and cats, their kind in the wild, eat a large amount of calcium. This happens because they chew on, and swallow, bones which have large quantities of calcium in their makeup. It is assumed that with time they have adapted to having this kind of diet. It is not completely clear that they must have this much calcium to be healthy. In other words, perhaps they can adapt to lower levels. It certainly seems that way for many of the animals I have known that, for one reason or another, have had small amounts of calcium in their diets. They often seem just fine.

There is evidence that the growing animal is the one most sensitive to calcium deficiency. This makes sense if we remember that it is during this time that the bones of the body are rapidly enlarging. They are made up primarily of calcium and phosphorus. In any case, it seems wise to supply the amounts of calcium that are typical of the natural diet and our recipes are formulated with that consideration.

To give you some idea of how much more calcium is "required" by a dog compared to a human being, consider this comparison. The amount of calcium the average woman needs is the same as that required by a small 10 lb. dog. A larger dog, say a 100 lb. German Shepherd requires about 10 times as much as this average woman.

It is difficult to find sources of calcium that can add this much to the diet. The natural source is bones and we find that this is also the most ample source with which to formulate diets. It is also possible to concentrate calcium from vegetable sources by a special method of extraction. This is the way the supplement Animal Essentials (Aquamin) is made — from seaweed.

Advantages of vegetable sources of calcium

There are some advantages to a vegetable source. Bones contain both calcium and phosphorus, with more calcium in them than phosphorus. We also know that animals need to have a balance of calcium to phosphorus in the ratio of 2:1, e.g., twice as much calcium as phosphorus. What this means is that to come out with enough extra calcium from bones, you have to use a lot more total minerals to cancel out the extra phosphorus. It turns out that the phosphorus in the bone meal makes the requirement for calcium even higher.

This would not be a problem in the natural state but when we are feeding grains and vegetables, the balance of these minerals has to be adjusted accordingly and we get into these issues. A vegetable source of calcium therefore has the advantage of providing just calcium without the unwanted phosphorus.

Another advantage of non-animal sources of calcium have to do with diseases like "Mad Cow" which can be transmitted through animal products. Granted the danger of this is extremely small but it does give another reason to prefer the vegetable sources.

Bones can also contain toxic elements like arsenic, lead, mercury, & radioactive strontium. This is because these elements have contaminated our world, coming from the use of gasoline, agricultural products, nuclear reactions and so on. The contaminants are picked up by grazing animals (e.g., sheep, cattle) and deposited in their bones. Thus it is important that the bone meal source has been checked for these substances. It is often bone meal from other countries, less industrial, that can be used while bones from cattle

in the US are often quite contaminated. This is one reason that you will find warnings on bone meal in garden supply centers, that it is not to be used in food.

It is a little known fact that commercial pet foods use bones from US cattle & are often unacceptably high in lead. Very few veterinarians know this or consider this when treating ill animals yet excess lead can cause a myriad of serious problems including serious anemia, intestinal problems and serious disorders leading to death. In the sources given below, you will find what I know about the product. You will also find that the sources of calcium described here vary considerably in the concentration of calcium. One teaspoon can contain anywhere from 500 mg to almost 2000 mg of calcium depending on the product.

At the end of this article, you will see the recipes from our book listed with the amounts of each calcium supplement, in level teaspoons, to be added to each recipe to make it balanced.

Company	Ingredients ¹	Other substances
Animal Essentials (from seaweed harvested off Cork, Ireland. Contains no animal products.)	Calcium: 34% (1000 mg. per tsp.) Phosphorus: 0.06%.	Magnesium: 3.2%. Sulphur: 0.3%. Boron: 25 ppm (parts per million). Copper: 2 ppm. Zinc: 22 ppm. Selenium: 1.0 ppm. Iodine: 20 ppm. Arsenic: 1.0 ppm. Cadmium: 0.10 ppm. Mercury: < 0.008 ppm. Lead: < 0.9 ppm. Tin: < 1.7 ppm. Iodine: < 9 ppm.
KAL, Inc. Bone Meal (from sterilized and edible bones.)	(per level teaspoon) Calcium: 1,500 mg. Phosphorus: 750 mg.	(per level teaspoon) Magnesium: 38 mg. Iron: 1.4 mg. Zinc: .75 mg. Copper: 38 micrograms. Lead: 0.2 ppm (parts per million). Fluoride: 2 mg. Note: Contains no added yeast, wheat, corn, milk, egg, soy, glutens, sugar, artificial colors, starch, or preservatives.
NaturVet Bone Meal Powder (from bones.)	Calcium: 20% minimum (860 mg. per tsp.) Phosphorus: 10% minimum. Protein: 8% minimum of total product. Fat: 8% minimum. Fiber: 1% minimum.	Arsenic: 1.0 ppm (parts per million). Mercury: 0.05 ppm. Lead: 1.0 ppm.

¹ We try here to have the same values for each product but not every company lists things the same way. For example, it is to the companies advantage to list calcium as calcium oxide which is the natural form that calcium occurs in as this makes the amount look larger on the label. However, only 71% of the total calcium oxide is calcium based on atomic number (calcium = 40, oxygen contributing an atomic number of 16). Where possible calculations were made to express calcium as *elemental calcium*, not as a compound. The information was provided by the various companies profiled.

Company	Ingredients	Other substances
Now Bone Meal Powder (from bones.)	(per level teaspoon) 75% tricalcium phosphate Protein: 9–14% Fat: 0–2% Calcium: 31.2–33.5% Phosphorus: 32–33% Calcium: 500 mg. Phosphorus: 250 mg. Magnesium: 12 mg.	Lead: <0.05 ppm (parts per million). Iron: 330.0 ppm. Copper: 19.0 ppm. Zinc: 185.0 ppm. Total heavy metals: < 10 ppm. Pesticide: None. Note: Product not from genetically engineered animals, contains no artificial flavors or colors and is preservative free. <i>If available</i> , from non-irradiated material.
Solgar Bone-all (from bones, including marrow.)	(per level teaspoon) Protein: <1 g. Calcium: 714 mg. Phosphorus: 336 mg.	Lead: < 1 ppm (parts per million). Note: No testing for arsenic or mercury though every batch tested for quality. Has been manufacturing since 1947.
Solid Gold (from fresh USDA approved beef bones.)	Calcium: 25% minimum, 27% maximum. (approx. 1369 mg. per level tsp.) Phosphorus: 11–13% minimum (684 mg per level tsp.) Fat: 12–14%. Protein: 12–14%. Ash: < 68%.	Lead: < 1.0 ppm (parts per million) . Arsenic: < 1.0 ppm. Mercury: < 0.05 ppm.

Instructions

To simplify the decision as to how much calcium to use in each recipe you will see, in what follows, the amounts (in level teaspoons) of each supplement to add to the recipe as presented in our book *Dr. Pitcairn's Complete Guide to Natural Health in Dogs and Cats*, second edition, Rodale Press, 1995.

Calcium Supplementation for Cat Recipes

Bone Meal Source (tsp)	<u>KAL</u>	Bone Meal Source (tsp)	<u>NaturVet</u>
Cat Beefy Oats	2.7	Cat Beefy Oats	4.7
Cat Poultry Delight	2.7	Cat Poultry Delight	4.7
Feline Feast	2.1	Feline Feast	3.7
Cat Mackerel Loaf	0.8	Cat Mackerel Loaf	1.4
Fatty Feline Fare	1.6	Fatty Feline Fare	2.8
Quick Feline Eggfest	0.2	Quick Feline Eggfest	0.3
Quick Feline Meatfest	0.4	Quick Feline Meatfest	0.7
Kitten Formula	0.2	Kitten Formula	0.3
Cat Growth Diet	1.9	Cat Growth Diet	3.3
Veg. Polenta, Cats	0.7	Veg. Polenta, Cats	1.2
Cat Allergy Diet #1	1.6	Cat Allergy Diet #1	2.8
Cat Allergy Diet #2	3.7	Cat Allergy Diet #2	6.5
Feline Kidney Diet	1.0	Feline Kidney Diet	1.7
Cat Weight Loss Diet	1.2	Cat Weight Loss Diet	2.1
Healthy Powder	6.0	Healthy Powder	10.5
Healthy Powder, no yeast	2.1	Healthy Powder, no yeast	3.7
Kitty Crunchies	3.9	Kitty Crunchies	6.7
Kitty Catnip Cookies	0.20	Kitty Catnip Cookies	0.35

All numbers for each recipe indicate how many level teaspoons of the bone meal source are needed to meet the calcium requirements for that recipe. Note that 3 teaspoons also = 1 tablespoon and can be easier to measure. Round off amounts as it need not be exact.

Calcium Supplementation for Cat Recipes

Bone Meal Source (tsp)	<u>Solid Gold</u>	Bone Meal Source (tsp)	<u>Now Bone Meal</u>
Cat Beefy Oats	2.9	Cat Beefy Oats	8.0
Cat Poultry Delight	2.9	Cat Poultry Delight	8.0
Feline Feast	2.3	Feline Feast	6.4
Cat Mackerel Loaf	0.9	Cat Mackerel Loaf	2.4
Fatty Feline Fare	1.8	Fatty Feline Fare	4.8
Quick Feline Eggfest	0.2	Quick Feline Eggfest	0.5
Quick Feline Meatfest	0.4	Quick Feline Meatfest	1.2
Kitten Formula	0.2	Kitten Formula	0.5
Cat Growth Diet	2.0	Cat Growth Diet	5.6
Veg. Polenta, Cats	0.7	Veg. Polenta, Cats	2.0
Cat Allergy Diet #1	1.8	Cat Allergy Diet #1	4.8
Cat Allergy Diet #2	4.1	Cat Allergy Diet #2	11.2
Feline Kidney Diet	1.1	Feline Kidney Diet	3.0
Cat Weight Loss Diet	1.3	Cat Weight Loss Diet	3.6
Healthy Powder	6.6	Healthy Powder	18.0
Healthy Powder, no yeast	2.3	Healthy Powder, no yeast	6.4
Kitty Crunchies	4.2	Kitty Crunchies	11.6
Kitty Catnip Cookies	0.22	Kitty Catnip Cookies	0.60

All numbers for each recipe indicate how many level teaspoons of the bone meal source are needed to meet the calcium requirements for that recipe. Note that 3 teaspoons also = 1 tablespoon and can be easier to measure. Round off amounts as it need not be exact.

Calcium Supplementation for Cat Recipes

Bone Meal Source (tsp)	<u>Solgar</u>	Bone Meal Source (tsp)	<u>Animal Essentials</u>
Cat Beefy Oats	5.6	Cat Beefy Oats	4.0
Cat Poultry Delight	5.6	Cat Poultry Delight	4.0
Feline Feast	4.5	Feline Feast	3.2
Cat Mackerel Loaf	1.7	Cat Mackerel Loaf	1.2
Fatty Feline Fare	3.4	Fatty Feline Fare	2.4
Quick Feline Eggfest	0.4	Quick Feline Eggfest	0.3
Quick Feline Meatfest	0.8	Quick Feline Meatfest	0.6
Kitten Formula	0.4	Kitten Formula	0.3
Cat Growth Diet	3.9	Cat Growth Diet	2.8
Veg. Polenta, Cats	1.4	Veg. Polenta, Cats	1.0
Cat Allergy Diet #1	3.4	Cat Allergy Diet #1	2.4
Cat Allergy Diet #2	7.8	Cat Allergy Diet #2	5.6
Feline Kidney Diet	2.1	Feline Kidney Diet	1.5
Cat Weight Loss Diet	2.5	Cat Weight Loss Diet	1.8
Healthy Powder	12.6	Healthy Powder	9.0
Healthy Powder, no yeast	4.5	Healthy Powder, no yeast	3.2
Kitty Crunchies	8.1	Kitty Crunchies	5.8
Kitty Catnip Cookies	0.42	Kitty Catnip Cookies	0.30

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Calcium Supplementation for Dog Recipes

Bone Meal Source (tsp) KAL

Doggy Oats	3.8
Mini Doggy Oats	1.0
One on One	1.1
Dog Loaf	0.7
Quick Canine Oats	0.4
Quick Canine Oatmeal	0.2
Quick Canine Hash	0.8
Dog Growth Diet A	2.9
Dog Growth Diet B	1.6
Dog Growth Diet C	1.6
Puppy Formula	0.3
Veg. Polenta, Dogs	0.4
Veg. Mexi-Dogs	2.8
Easy Eggs & Grains	0.8
Beans & Millet	3.0
Dog Allergy Diet #1	1.5
Dog Allergy Diet #2	3.5
Canine Kidney Diet	1.6
Dog Weight Loss #1	0.4
Dog Weight Loss #2	1.6
Healthy Powder	6.0
Healthy Powder, no yeast	2.1
Wheat/Rye Crisps, dogs	0.2
Doggy Crunchies	3.9
Dog Biscuits Deluxe	0.4
Meat Suppl., Dogs	0.8
Egg Suppl., Dogs	0.1
Cottage Cheese Suppl.	0.1

Bone Meal Source (tsp) NaturVet

Doggy Oats	6.6
Mini Doggy Oats	1.7
One on One	1.9
Dog Loaf	1.2
Quick Canine Oats	0.8
Quick Canine Oatmeal	0.4
Quick Canine Hash	1.4
Dog Growth Diet A	5.1
Dog Growth Diet B	2.8
Dog Growth Diet C	2.8
Puppy Formula	0.6
Veg. Polenta, Dogs	0.7
Veg. Mexi-Dogs	4.9
Easy Eggs & Grains	1.4
Beans & Millet	5.2
Dog Allergy Diet #1	2.6
Dog Allergy Diet #2	6.0
Canine Kidney Diet	2.8
Dog Weight Loss #1	0.7
Dog Weight Loss #2	2.8
Healthy Powder	10.5
Healthy Powder, no yeast	3.7
Wheat/Rye Crisps, dogs	0.3
Doggy Crunchies	6.7
Dog Biscuits Deluxe	0.7
Meat Suppl., Dogs	1.3
Egg Suppl., Dogs	0.3
Cottage Cheese Suppl.	0.2

All numbers for each recipe indicate how many teaspoons of the bone meal source are needed to meet the calcium requirements for that recipe. Note that 3 teaspoons also = 1 tablespoon and can be easier to measure. Round off amounts as it need not be exact.

Calcium Supplementation for Dog Recipes

Bone Meal Source (tsp)	<u>Solid Gold</u>	Bone Meal Source (tsp)	<u>Now Bone Meal</u>
Doggy Oats	4.2	Doggy Oats	11.4
Mini Doggy Oats	1.1	Mini Doggy Oats	2.9
One on One	1.2	One on One	3.2
Dog Loaf	0.7	Dog Loaf	2.0
Quick Canine Oats	0.5	Quick Canine Oats	1.3
Quick Canine Oatmeal	0.2	Quick Canine Oatmeal	0.7
Quick Canine Hash	0.9	Quick Canine Hash	2.4
Dog Growth Diet A	3.2	Dog Growth Diet A	8.8
Dog Growth Diet B	1.8	Dog Growth Diet B	4.8
Dog Growth Diet C	1.8	Dog Growth Diet C	4.8
Puppy Formula	0.4	Puppy Formula	1.0
Veg. Polenta, Dogs	0.4	Veg. Polenta, Dogs	1.2
Veg. Mexi-Dogs	3.1	Veg. Mexi-Dogs	8.4
Easy Eggs & Grains	0.9	Easy Eggs & Grains	2.4
Beans & Millet	3.3	Beans & Millet	9.0
Dog Allergy Diet #1	1.6	Dog Allergy Diet #1	4.4
Dog Allergy Diet #2	3.8	Dog Allergy Diet #2	10.4
Canine Kidney Diet	1.8	Canine Kidney Diet	4.8
Dog Weight Loss #1	0.4	Dog Weight Loss #1	1.2
Dog Weight Loss #2	1.8	Dog Weight Loss #2	4.8
Healthy Powder	6.6	Healthy Powder	18.0
Healthy Powder, no yeast	2.3	Healthy Powder, no yeast	6.4
Wheat/Rye Crisps, dogs	0.2	Wheat/Rye Crisps, dogs	0.6
Doggy Crunchies	4.2	Doggy Crunchies	11.6
Dog Biscuits Deluxe	0.4	Dog Biscuits Deluxe	1.2
Meat Suppl., Dogs	0.8	Meat Suppl., Dogs	2.3
Egg Suppl., Dogs	0.2	Egg Suppl., Dogs	0.4
Cottage Cheese Suppl.	0.1	Cottage Cheese Suppl.	0.4

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Calcium Supplementation for Dog Recipes

Bone Meal Source (tsp)	<u>Solgar</u>	Bone Meal Source (tsp)	<u>Animal Essentials</u>
Doggy Oats	8.0	Doggy Oats	5.7
Mini Doggy Oats	2.0	Mini Doggy Oats	1.5
One on One	2.2	One on One	1.6
Dog Loaf	1.4	Dog Loaf	1.0
Quick Canine Oats	0.9	Quick Canine Oats	0.7
Quick Canine Oatmeal	0.5	Quick Canine Oatmeal	0.3
Quick Canine Hash	1.7	Quick Canine Hash	1.2
Dog Growth Diet A	6.2	Dog Growth Diet A	4.4
Dog Growth Diet B	3.4	Dog Growth Diet B	2.4
Dog Growth Diet C	3.4	Dog Growth Diet C	2.4
Puppy Formula	0.7	Puppy Formula	0.5
Veg. Polenta, Dogs	0.8	Veg. Polenta, Dogs	0.6
Veg. Mexi-Dogs	5.9	Veg. Mexi-Dogs	4.2
Easy Eggs & Grains	1.7	Easy Eggs & Grains	1.2
Beans & Millet	6.3	Beans & Millet	4.5
Dog Allergy Diet #1	3.1	Dog Allergy Diet #1	2.2
Dog Allergy Diet #2	7.3	Dog Allergy Diet #2	5.2
Canine Kidney Diet	3.4	Canine Kidney Diet	2.4
Dog Weight Loss #1	0.8	Dog Weight Loss #1	0.6
Dog Weight Loss #2	3.4	Dog Weight Loss #2	2.4
Healthy Powder	12.6	Healthy Powder	9.0
Healthy Powder, no yeast	4.5	Healthy Powder, no yeast	3.2
Wheat/Rye Crisps, dogs	0.4	Wheat/Rye Crisps, dogs	0.3
Doggy Crunchies	8.1	Doggy Crunchies	5.8
Dog Biscuits Deluxe	0.8	Dog Biscuits Deluxe	0.6
Meat Suppl., Dogs	1.6	Meat Suppl., Dogs	1.2
Egg Suppl., Dogs	0.3	Egg Suppl., Dogs	0.2
Cottage Cheese Suppl.	0.3	Cottage Cheese Suppl.	0.2

All numbers for each recipe indicate how many teaspoons of the bone meal source are needed to meet the calcium requirements for that recipe. Note that 3 teaspoons also = 1 tablespoon and can be easier to measure. Round off amounts as it need not be exact.