

Periodic Graphics

A collaboration between C&EN and
Andy Brunning, author of the popular
graphics blog *Compound Interest*

More
online

To see more of
Bunning's work, go to
compoundchem.com.
To see all of C&EN's
Periodic Graphics, visit
cenm.ag/periodicgraphics.

The chemistry of cat and dog kibble



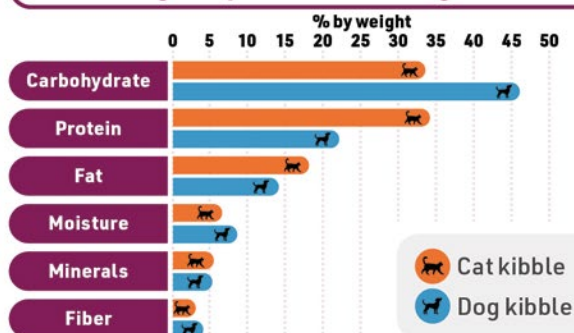
What is kibble made of, how do cat food and dog food differ, and what makes our feline and canine friends salivate over it?



What is kibble?

Kibble, a type of dry food, is a mix of proteins, carbohydrates, fats, and fiber. Manufacturers also add important vitamins and minerals to keep pets healthy.

Average composition of cat and dog kibble

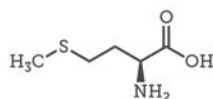


Source: *Animals* 2020, DOI: 10.3390/ani10030541.

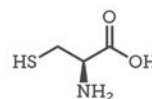
Cats have a higher dietary protein requirement than dogs. They also need fewer carbohydrates.

Comparing cat and dog kibble

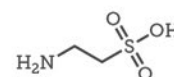
Taurine, an amino acid, is central to cat and dog health. Most dogs synthesize sufficient taurine from the amino acids methionine and cysteine. Cats have to obtain it from their food, so the protein in cat kibble is often from taurine-containing animal sources.



Methionine

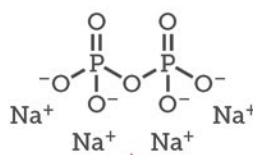


Cysteine



Taurine

Manufacturers add palatants—compounds to make kibble appealing to cats and dogs. In cat food, these include pyrophosphate salts. Scientists think they intensify the taste of amino acids in the food.



Sodium pyrophosphate



T1R1/T1R3

Interacts with amino acid receptors

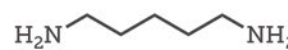


Prevents the formation of kidney stones

Other common palatants for cats and dogs are the amines putrescine and cadaverine, compounds that decaying meat produces.



Putrescine



Cadaverine

