



The most sustainable cat litter

Cat litter is a top seller in pet accessories with a worldwide sales volume of five million metric tonnes and a value of almost \$3.5 billion (€3 billion). In recent years, we have seen new organic products entering the cat litter market. They are positioned as more sustainable and natural. But are they?

A brief history

A cat's natural behaviour is to go into the garden. For domestic cats, the litter tray was invented long before the Second World War. At that time, people were using ordinary sand, wood shavings or old newspapers as litter. It was not very hygienic and quite smelly. In 1948, Ed Loewe invented cat litter. Initially, this was a clay-type product called attapulgite, with interesting absorption properties.

In the early eighties, clumping cat litter made of bentonite was invented. The clumps lock in the unpleasant odours and can be scooped out once a day. After scooping, the litter tray is clean again and has to be filled up to the original level. In contrast, with non-clumping litter, the entire litter tray has to be renewed once or twice a week, which makes clumping material more economical to use.

In the nineties, the first non-clay products entered the market. Typically, the non-clay or organic cat litters (made from wood, corn, straw, hay, coconut skins, et cetera) do not form clumps. However, in recent years we have seen further development. Thanks to special processing and additives, clumping organic products have entered the market.

Litter reputations

The disadvantage of mineral-based products is that the raw materials are mined, potentially causing unnecessary harm to the environment. On the other hand, non-mineral-based products are organic in origin and are generally residue from another organic product or production process. Obviously, this is seen as more sustainable and natural. So today, organic litters have a better image with respect to sustainability. But is this well-deserved?

Litter

Overview of the most common types of cat litter

CAT LITTER TYPE	CLUMPING	NON-CLUMPING
mineral-based	bentonite	aerated concrete attapulgate moler clay sepiolite silica gel
organic-based	cereal chips corn chips wood chips	hay pallets paper pellets wood pellets

Source: various sources Sivomatic 2017

Market share of cat litter worldwide

CAT LITTER TYPE	CLUMPING	NON-CLUMPING	TOTAL
mineral-based	61%	32%	93%
organic-based	4%	3%	7%
total	65%	35%	100%

Source: various sources Sivomatic 2017

Product life cycle inventory

In order to compare the different product categories, Sivomatic carried out an extensive product life cycle inventory (see diagram top right). It is interesting to see that the production steps in the different product categories are very similar, if not identical.

Clay

Mineral clay products start their journey in a mine. For cat litter clay, it is always open pit mining. In any country, mining goes with heavy legislation and recultivation obligations. After mining, the land will be brought back in the original state to the extent possible. E.g. hilly areas will return ten meters lower or farmers will return to their land at lower altitudes.

Wood

Ideally, wood products are made of local wood waste. However, in reality most products



unfortunately originate from industrial production forests. Only clean soft woods can be used, e.g. pine and spruce. Hard woods like oak, et cetera, cannot be used due to its low absorption capabilities.

Paper or corn

Collecting cereal or corn waste for cat litter is not easy. In an agricultural country like The Netherlands, all the corn waste goes into animal feed, due to its caloric value. This is a higher grade of recycling than turning it into cat litter. Corn residue needs careful washing and cooking to prevent the organic content to be a growing medium for bacteria of cat urine and faeces.

Paper waste needs to be carefully selected due to inks. Paper waste may be smelly and needs washing/cooking for cleaning in order to get a suitable end product.

▶ SEE NEXT PAGE



“ APPA has been a tremendous help in assisting us in developing our U.S. business. Great team, always ready with the right answers. ”

Chantal Saelen, Moderna Products

BECOME AN APPA MEMBER NOW TO RECEIVE SPECIALIZED BENEFITS AND EXHIBIT AT GLOBAL PET EXPO.

APPA is the Leading International Trade Association for Pet Product Manufacturers, Importers, Manufacturers’ Reps and Suppliers of Companion Animals.

For more information and to join contact us at memberservices@americanpetproducts.org or call 001.203.532.0000x520

APPA AND YOU... ADVANCING THE PET INDUSTRY

 **Global Pet Expo**
 March 21-23, 2018
 Orange County Convention Center
 Orlando, Florida

APPA
 American Pet Products Association
www.americanpetproducts.org

All product categories need crushing and sieving, packing and shipping. In general, clay products will end their life in incineration plants, whereas wood, paper and corn will be disposed in the green bin and be fermented.

However, we must add that there are quite a lot of exceptions to this rule. Depending on local legislation, in some areas all litters can be put in the green bin, whereas in other cases not any litter is allowed. Toilet flushing of any litter is forbidden in most countries, due to blockage risks.

CO₂ emissions

Following an inventory of the different stages the product passes through, the next step was to translate this into a life cycle analysis in terms of CO₂ emission. Sivomatic carried out a detailed life cycle analysis for The Netherlands, with interesting results.

CO₂ per kilogram

In general, all litters show very low CO₂ emissions of around 170 to 410 grammes of CO₂ per kilogram of cat litter (see table below). Non-clumping organic material shows the lowest value of 170 grammes of CO₂ per kilogram of cat litter.

Silica gel is excluded from the calculations because this product (produced in China) has more than ten times the CO₂ pressure of other types. It takes approximately five tonnes of coal to produce one tonne of silica gel.

CO₂ emission per kg (grammes of CO₂ per kilogram of cat litter)

CAT LITTER TYPE	CLUMPING	NON-CLUMPING
mineral-based	250	320*
organic-based	410	170

* Excluding silica gel

Source: Sivomatic 2017

Litter

CO₂ per cat

The CO₂ emission per kilogram of cat litter is good to know, but the consumer uses cat litter by volume and not by kilogram. No matter the weight, people fill their litter tray by volume, with a layer of five to eight centimetres.

If we adjust the numbers for density and material use, we get the grammes of CO₂ per cat per day (see table below). Clumping litter shows figures from 24 to 19 grammes for mineral and organic-based litters. Non-clumping shows higher figures at 42 and 32 grammes CO₂ per cat per day.

CO₂ emission per cat per day (grammes of CO₂ per cat per day)

CAT LITTER TYPE	CLUMPING	NON-CLUMPING
mineral-based	24	42*
organic-based	19	32

* Excluding silica gel

Source: Sivomatic 2017

It is noteworthy that the figures in both tables are very different. For example, clumping organic goes from the worst score at 410 per kilogram to the best score at 19 per cat.

We have to realize that all these numbers are aggregates. For instance, bentonite is sold as coarse grain and fine grain. The finer product is twice as economical as the coarse product, due to more compact clumps and a better lock-in effect for odours. With organic clumping litter, we can say that clumping wood is better than clumping corn, due to easier production. The use of additives, like perfumes, on any material will improve material efficiency.

If we calculate the weighted average of all litter, the outcome is 33 grammes of CO₂ per cat per day. This is the equivalent of just one 12-watt LED lamp burning only six hours per day – so very low.

The best and the worst

CAT LITTER TYPE	GRAMMES OF CO ₂ PER CAT PER DAY
White Turkish bentonite	12
Clumping wood chips	14
Aerated concrete	47
Silica gel	741
All litters*	33

* Excluding silica gel

Source: Sivomatic 2017

In short

This research obviously has its limitations. We are talking about CO₂ as if this were the only parameter that matters. Therefore we can draw the following conclusions only carefully:

- The life cycle inventory of all litters is surprisingly similar.
- Clumping litters outperform non-clumping litters, because only the clumps have to be disposed of.
- Clumping organic litter shows the lowest CO₂ pressure per cat per day on average.
- Density and efficiency in material use are the most important factors in comparing the different litters.
- Finer grains and additives like perfumes improve material efficiency.
- The average outcome of 33 grammes of CO₂ per cat per day is very low compared to other consumer goods.
- Clumping Turkish white bentonite and clumping wood chips are the winners when it comes to CO₂ only.

Having said all this, if your cat got to choose, the real test winner would probably be the garden. ♦



Peter Verseveldt

Owner, Sivomatic Netherlands
p.verseveldt@sivomatic.nl
sivomatic.nl