



Products that resemble foods and appeal to children

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GreenFacts

Potential risks of accidental ingestion

Level 2 - Details on Products that resemble foods and appeal to children

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The answers to these questions are a faithful summary of the scientific opinion produced in 2011 by Scientific Committee on Consumer Safety (SCCS):
"Opinion on the potential health risks posed by chemical consumer products resembling food and/or having child-appealing properties. (2011)"

The full publication is available at: <https://copublications.greenfacts.org/en/accidental-poisoning/>
and at: <http://ec.europa.eu/health/opinions/en/accidental-poisoning/>

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- Each question is answered in Level 1 with a short summary.
- These answers are developed in more detail in Level 2.
- Level 3 consists of the Source document, the internationally recognised scientific opinion which is faithfully summarised in Level 2 and further in Level 1.

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1. Past cases of accidental poisoning by cosmetics & liquid household products

Children aged between 6 months and 6 years are involved in accidental poisonings more frequently than any other age group and the majority of incidents happen at home. Toddlers are particularly prone to swallowing cosmetics and household products because children of that age are curious, can move about and may mistake a brightly coloured product for a sweet or drink.



Consumer products packaged to imitate food [see Annex 1, p. 9]

The reported incidents usually involve liquid products in the case of children under 3 years of age, solid and liquid products for children between 3 and 12, and mostly solid products for older children.

The product categories, which, apart from medicines, are involved most frequently in childhood poisoning accidents, are cosmetics, toiletries, pharmaceuticals and household cleaners. Products commonly ingested include toilet cleaners, dishwashing detergents, descalers, bleach, drain cleaners, pesticides, fuels, solvents, disinfectants, fabric conditioners, washing-up liquid, nail polish and polish remover, aftershave, perfume, soap, floor and furniture polish, paintbrush cleaners and thinners, and paraffin.

Poison centres in various EU and non-EU countries register cases of accidental poisoning, including such caused by consumer products. However, most incidents are harmless and cause very mild or no symptoms so they often go unreported. Many children who drink household products are not brought to the doctor because they show no ill effects or they are believed to be inconsequential and even those who do consult a doctor often require no treatment. Doctors who have experience treating these cases rarely contact poison control centres because they don't need any advice. As a result, it is difficult to estimate the actual number of accidental poisonings and there is even less information on the details of the products involved such as the packaging, the concentrations of ingredients, storage details or the cause of the poisoning.

There are no statistics available to estimate the burden of injuries caused by poisonings. However, the death rate from these accidental poisonings is very low (less than 0.05% of reported cases) and for children it is probably even lower. Elderly people often show the same symptoms as children but they can fare worse if they have underlying medical problems.

The main symptoms that occur have to do with the digestive system, such as vomiting and stomach pains, or with the nervous system, such as loss of consciousness or loss of coordination. There can also be some other symptoms such as rashes, shortness of breath, coughs, difficulty swallowing, as well as low blood pressure and irregular heartbeat. One serious risk is if the affected person breathes in vomit by accident. Vomit by itself is acidic and can damage the lungs, but if there are toxic chemicals in the vomit it can make the damage much worse, causing a condition known as chemical pneumonia.

Very little is known specifically on the effect of accidental ingestion of household chemicals or cosmetics that resemble food or have child-appealing properties, but a similar pattern of symptoms is expected.

2. What makes children and elderly people more likely to swallow such products?

2.1 What makes children more likely to swallow such products?

Young children are inquisitive, put things in their mouth and are not aware of consequences so they are the age group most likely to drink poisons by accident, particularly between 6 months and 6 years. Fatal poisonings are more common in children under the age of 1 but the peak time for non-fatal poisonings is between the ages of 1 and 4. The danger is particularly high for toddlers - at around the age of 2, when young children become more mobile and able to get hold of poisons. Often children take just one sip or a swallow and the typical amounts drunk are between 4.5 ml and 9 ml.

Accidental poisonings may be more likely when the children are not supervised closely and the adults are distracted, for instance because they are preparing a meal or doing other chores. Children who are thirsty or hungry are more likely to drink from any open container within their reach, particularly if the smell is nice. There are still many cases which are related to storing corrosive solutions in unlabelled containers or even drinking bottles which other adults unknowingly give to their children.

Statistically, there is a higher risk of accidental injuries, including poisoning in families of low socioeconomic status. Many factors could be involved such as stress, education and income of the family and absence of parents. Poorer families tend to have more hazards in the home, but identifying potential dangers can be difficult for parents of all incomes and accidental poisonings also happen in wealthy households.

The way in which toxins are broken down, stored and excreted by the body is different for children than it is for adults which could make them more susceptible than adults.. This is especially true for very young children, but by the time they are 2, most of the biological factors that affect the way the body deals with poisons have matured.

The nervous, reproductive, endocrine and immune systems go through important developmental stages during childhood so exposure to poisons at this crucial time can have particularly lasting consequences.

2.2 Why might some elderly people swallow such products?

For the purpose of this opinion, the elderly are considered as persons aged 75 years and above, when many people show some physical and mental decline as a result of aging.

This natural deterioration often causes no problems unless the body is under stress because of an infection, illness or, as in this study, following accidental poisoning. In this case, elderly people are worse affected than younger people, recover more slowly and could suffer permanent damage. The outcome is even more serious if the elderly person also has some physical or mental disease, is under or malnourished or suffers deprivation.

Although accidental poisoning in the elderly is a significant problem, there is very little research on probable causes but several factors are likely to play a role. Many people over 75 have trouble smelling and seeing properly and cannot easily tell when a substance is toxic. Those who are disoriented because of illness or medication are more likely to confuse food and non-food items.

Older people are generally aware of hazards in the home and of safety information in products. However, a significant proportion find it difficult to handle products and packaging, or have memory difficulties so that they cannot follow long sets of instructions or warnings, particularly if these are written in small print that is hard to read.

Elderly people are particularly vulnerable because they are often left by themselves for extended periods and they are not under constant observation. If they have an accident, they may not call for help immediately or at all if they feel ashamed or not sure of what has happened.

3. What makes products appeal to children or resemble food?

There have been no studies to evaluate the effect of different characteristics of a product that make it resemble food or appealing to children on the likelihood of accidental poisoning. However, it is likely that a product that looks, smells and tastes like food and is attractively packaged, is more likely to be confused with food and ingested, particularly by children, than a product which does not resemble food and is stored in a plain container.



Some warning labels could make products even more appealing to children.
Credit: Wikimedia commons

Solid food and drink comes in many different colours. In the past, colours like blue or green were only used for products such as cleaners but now these colours are also used in food items so it is hard to distinguish between food and non-food products by their colour alone.

Some cosmetics can be mistaken for food because they are shaped like real food items, or are packaged in food containers such as plates, bowls or glasses. Labels that contain food pictures and fake nutrition tables make cosmetic products and cleaners look even more like food.

Manufacturers sometimes put names, pictures and writing in the labels that describe the smell and taste of their products, and these often imitate food items. Cosmetics that are sold or stored next to foodstuffs can be confused for food items and accidentally ingested.

Children can be attracted to anything within their reach but some products are particularly appealing:

Children like attractively coloured packaging but they do not have one favourite colour. Instead, their colour preference depends on the type of product, the choice of colours on offer and the age of the child. The shape of the container does not seem to make products any more or less appealing to children but packaging in vivid colours showing familiar characters from TV or books, do.

Product labels or warnings have no effect on young children because they cannot read them. Hazard symbols such as skull and cross bones may make products even more attractive.

Include chapter on adverse effects (with info from opinion chapter 6.4), currently this only appears in conclusion!

4. What could make those products dangerous to swallow?

4.1 Which products are most harmful?

Swallowing cosmetics is unlikely to cause any serious health effects either for children or elderly people, although some, such as nail polish, can contain more toxic substances. Ingesting other household products is potentially more harmful.



Ingesting household cleaning products is more harmful than ingesting cosmetics.
Credit: Sanja Gjenero

Household products frequently involved in accidental poisonings are detergents, cleaners and bleaches.

Some of their constituents are not very toxic when considered individually but when combined, can have worse effects than each component separately. The damage they cause also depends on the amount ingested, the contact time, the pH of the substance and whether it is a solid or a liquid.

4.2 What ingredients are most harmful?

4.2.1 Corrosives substances – acids and bases - such as bleach or oven and drain cleaners are responsible for severe accidental poisonings from household products, and can cause severe burns to the oesophagus and stomach and even perforations that can be potentially fatal.

The most common symptoms following a corrosive ingestion are difficulty swallowing, drooling, feeding refusal, abdominal pain and vomiting.

4.2.2 Essential oils have been used as a common cold remedy in medicine, as indoor air fresheners or conditioners in the household, for aromatherapy, in stain removers or other cleaning agents, in cosmetics, and also in industry, for example as a fat solvent.

The toxicity of individual essential oils varies, and specific data on poisonings is sparse, but a few oils have been singled out in poisoning cases. These are:

- Pine oil, which is a common component of cleaning solutions and is found in numerous household cleaning preparations. Because of its low viscosity and high volatility it can enter and damage the lungs.
- Wintergreen oil is a strongly aromatic with a sweet woody odour. Oil of Wintergreen may be used as a topical ointment or medicated oil for the relief of musculoskeletal pain and common colds. One teaspoon (5 ml) of it contains as much active ingredient as approximately 22 adult aspirin tablets, and can cause serious poisoning.
- Camphor is a common ingredient in many ointments. When swallowed it can cause irritation of the mouth and throat, nausea and vomiting, and it can also have neurological effects such as seizures, hallucinations, and coma.

4.2.3 Most detergents contain **surfactants** which remove dirt, stains, and soil from surfaces or textiles.

Surfactants are usually not directly poisonous. Foaming is the predominant problem, which can lead to vomiting, abdominal pain, flatulence and diarrhoea. In some cases, vomiting or the formation of foam in the mouth can lead the substance to enter the lungs.

4.2.4 Alcohols are used as solvents in cosmetic and household detergents. Mouthwashes containing alcohol, for instance, have great potential to be drunk in large quantities by children because they are made to look enticing, taste good, and are present in most homes.

5. What are current safety measures against poisoning?

The most effective way of preventing accidental poisoning is to replace the toxic ingredient by one which is less harmful. Child-resistant packaging is another very useful prevention method, credited with reducing the number of deaths from unintentional poisoning by about 85% in 32 years in England and Wales. Using containers with shapes and labels that make them less attractive to children could be another way of preventing poisonings. However, written warnings are not effective and warning labels may even attract children.



Blister packets can stop children swallowing whole bottles of medication.
Credit: GreenFacts

Children usually prefer sweet tastes so sometimes, bittering agents such as denatonium benzoate are added to cosmetics and cleaners to prevent accidental poisonings. Products spiked with even minute quantities of denatonium benzoate have an extremely unpleasant taste and would stop children drinking significant quantities of it. However, there is no evidence that this reduces the number of serious poisonings. In any case, severe poisoning is still possible when swallowing even small quantities of certain types of products, such as those containing high concentrations of acid or alkaline ingredients (e.g. former household dishwasher products and oven cleaners) or alcohols and glycols, such as anti-freeze and windscreen wash. The addition of bittering agents is also unsuitable for some products which are toxic when they are breathed in rather than ingested.

Education campaigns on safety measures directed to parents and other people who take care of children, as well as cleaners are also effective and today serious cases of poisonings in children are very rare. There have been serious incidents and even deaths for elderly people who have drunk products containing surfactants, but the number of cases is also in decline.

6. Conclusion

6.1 What characteristics increase the probability of confusing a product with food?

Cosmetics and household products can be confused with food if they are shaped like food, or have a colour, smell, taste or packaging that make them resemble food.

Whether or not a product is appealing to children is very subjective. Children can be attracted by nearly anything within their reach depending on many factors such as what else there is in their surroundings or how inquisitive they are. Research shows that children have a preference for sweet, fatty and fruity tastes and odours but there is no evidence that children like products of a particular colour, shape or consistency. Children also prefer product packages that display familiar cartoon or other characters from TV or books but product labels or warnings do not seem to have an effect on children up to 6 years old.

There are no studies that test whether or not products that could be mistaken food or are appealing to children, are more likely to be ingested by accident than those which do not. However, until there is more research available, the characteristics of a product can be

used to estimate how child-appealing it might be. For instance, a product that is shaped like food, smells and tastes sweet and displays familiar cartoon characters in vivid colours in its packaging, is more likely to appeal to children and be confused with food, than a product that is just shaped like food and tastes sweet.

6.2 What are the most common effects observed when those products are ingested?

The vast majority of accidental poisonings in children involving household consumer products cause no direct symptoms. Drinking these products is likely to cause stomach irritation but the effect is often very mild so cases are probably under-reported. The most common symptoms for children admitted to hospital after accidental poisonings are vomiting, abdominal pain, reduced consciousness, seizures and lack of coordination. Rashes, coughs and difficulty breathing and swallowing have also been observed. The death rate from these incidents is extremely low.

The contents of the stomach are very acidic so the lung tissue can be temporarily damaged if the child gets sick and some of the vomit enters the lungs. If the product swallowed is corrosive or if it contains surfactants or emulsifiers, the damage can be more severe and lasting. Aromatic oils can have the same effect as they are more likely to be breathed in rather than swallowed.

Elderly people show the same symptoms as children but if they have underlying medical problems they can suffer worse health effects and there have been some fatalities.

It would be useful if poison centres recorded how accidents happened to identify future trends and to evaluate the impact of any prevention and management measures.

6.3 What product ingredients could harm health when swallowed?

The common household cleaning products most frequently cited in poisonings are dishwashing and laundry detergents, toilet cleaners and bleaches.

The most harmful ingredients are corrosive substances (such as sodium hypochlorite, sodium hydroxide or hydrogen peroxide), surfactants, alcohols and glycerols, and some essential oils (pine oil, wintergreen oil and camphor). Swallowing these will cause different levels of injury depending on how long they are in contact with tissue, their concentration and their pH. Acid products with a very low pH are very corrosive, and alkaline products with a very high pH such as drain cleaners, are also very harmful.

The viscosity of the product is also important. Acidic ingredients with low viscosity can harm the digestive tract. Thick, alkaline liquids, can foam and cause gagging which increases the risk of them being aspirated into the lungs and causing additional damage.

Other ingredients such as colorants, polymers and plasticizers are also harmful and swallowing them accidentally can cause gastric upset, feelings of nausea and vomiting.

6.4 What circumstances increase the risk of serious poisoning?

There is very little research on the causes of accidental ingestions in young children and there are no specific data on whether or not products that resemble food or appeal to children are more often involved in poisonings.

The risk of suffering injuries in the home is higher for children living in families of low socio-economic status, as unsafe childcare practices and hazards are more common in these families, but there are risks of accidents in all homes.

Reduced supervision of children and lack of awareness about potential risks may increase the risk of accidental poisoning but there is very little direct evidence linking these factors to child injury.

Elderly people who accidentally ingest cosmetics and household products usually come to no lasting harm unless the product is very toxic or the amounts swallowed are large, but this is rare. There is little research on what makes elderly people more likely to be poisoned accidentally but possible factors are reduced senses of taste and smell, disorientation, impaired vision and lack of supervision or help.

Annex

Annex 1:

Annex I: Pictures of consumer products resembling food and/or having child-appealing properties



Source: SCCS , *Opinion on the potential health risks posed by chemical consumer products resembling food and/or having child-appealing properties* [see http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_056.pdf], (2011), Annex I, p.36

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