

Human feces

Human feces (or **faeces** in British English; Latin: *fæx*) are the feces (solid or semisolid metabolic waste) of the human digestive system, including bacteria. They vary significantly in appearance (i.e. size, color, texture), according to the state of the digestive system, diet and general health. Normally human feces are semisolid, with a mucus coating. Small pieces of harder, less moist feces can sometimes be seen impacted on the distal (leading) end. This is a normal occurrence when a prior bowel movement is incomplete, and feces are returned from the rectum to the intestine, where water is absorbed.

In the medical literature, the term "**stool**" is more commonly used than "feces".

Human feces together with human urine are collectively referred to as human waste or human excreta. Containing human feces, and preventing spreading of pathogens from human feces via the fecal-oral route, are the main goals of sanitation.

1 Characteristics

1.1 Classification

Main article: Bristol stool scale

The Bristol stool scale is a medical aid designed to classify the form of human feces into seven categories. Sometimes referred to in the UK as the Meyers Scale, it was developed by K. W. Heaton at the University of Bristol and was first published in the *Scandinavian Journal of Gastroenterology* in 1997.^[1] The form of the stool depends on the time it spends in the colon.^[2]

The seven types of stool are:

1. Separate hard lumps, like nuts (hard to pass)
2. Sausage-shaped but lumpy
3. Like a sausage but with cracks on the surface
4. Like a sausage or snake, smooth and soft
5. Soft blobs with clear-cut edges
6. Fluffy pieces with ragged edges, a mushy stool
7. Watery, no solid pieces. Entirely Liquid

Types 1 and 2 indicate constipation. Types 3 and 4 are optimal, especially the latter, as these are the easiest to pass. Types 5–7 are associated with increasing tendency to diarrhea or urgency.^[2]

Meconium is a newborn baby's first feces.

1.2 Color

Human fecal matter varies significantly in appearance, depending on diet and health.

1.2.1 Brown

Human feces ordinarily has a light to dark brown coloration, which results from a combination of bile, and bilirubin derivatives of stercobilin and urobilin,^[3] from dead red blood cells. Normally it is semisolid, with a mucus coating.

1.2.2 Yellow

Yellowing of feces can be caused by an infection known as *Giardiasis*, which derives its name from *Giardia*, an anaerobic flagellated protozoan parasite that can cause severe and communicable yellow diarrhea. Another cause of yellowing is a condition known as Gilbert's Syndrome. Yellow stool can also indicate that food is passing through the digestive tract relatively quickly. Yellow stool can be found in people with gastroesophageal reflux disease (GERD).

1.2.3 Pale or gray

Stool that is pale or grey may be caused by insufficient bile output due to conditions such as cholecystitis, gallstones, giardia parasitic infection, hepatitis, chronic pancreatitis, or cirrhosis. Bile salts from the liver give stool its brownish color. If there is decreased bile output, stool is much lighter in color.

1.2.4 Black or red

Feces can be black due to the presence of red blood cells that have been in the intestines long enough to be broken down by digestive enzymes. This is known as *melena*, and is typically due to *bleeding* in the upper digestive tract, such as from a *bleeding peptic ulcer*. Conditions that can also cause blood in the stool include hemorrhoids, anal fissures, diverticulitis, *colon cancer*, and ulcerative colitis. The same color change can be observed after consuming foods that contain a substantial proportion of animal blood, such as *black pudding* or *tiết canh*. Black feces can also be caused by a number of medications, such as *bismuth subsalicylate* (the active ingredient in Pepto-Bismol), and dietary *iron supplements*, or foods such as *beetroot*, *black liquorice*, or *blueberries*.^[4]

Hematochezia is similarly the passage of feces that are bright red due to the presence of undigested blood, either from lower in the digestive tract, or from a more active source in the upper digestive tract. *Alcoholism* can also provoke abnormalities in the path of blood throughout the body, including the passing of red-black stool. Hemorrhoids can also cause surface staining of red on stools, because as they leave the body the process can compress and burst hemorrhoids near the anus.

1.2.5 Blue

Prussian blue, or blue, a coloring used in the treatment of radiation, *cesium*, and *thallium* poisoning, can turn the feces blue. Substantial consumption of products containing blue food dye, such as *blue curaçao* or *grape soda*, can have the same effect.^[5]

1.2.6 Silver

A tarnished-silver or aluminum paint-like feces color characteristically results when biliary obstruction of any type (white stool) combines with *gastrointestinal bleeding* from any source (black stool). It can also suggest a carcinoma of the ampulla of Vater, which will result in gastrointestinal bleeding and biliary obstruction, resulting in silver stool.^[6]

1.2.7 Green

Feces can be green due to having large amounts of unprocessed bile in the digestive tract and

strong-smelling diarrhea. This can occasionally be the result from eating *liquorice candy*, as it is typically made with anise oil rather than liquorice herb and is predominantly sugar. Excessive sugar consumption or a sensitivity to anise oil may cause loose, green stools.^[7]

1.2.8 Violet or purple

Violet or purple feces is a symptom of *porphyria*.

1.3 Odor

Feces possess physiological odor, which can vary according to diet. For example, meat protein contains a lot of the sulfur-containing amino acid methionine, which is a precursor of the sulfur-containing odorous compounds listed below^{[8][9][10][11][12]} and health status. The odor of human feces is suggested to be made up from the following odorant volatiles:^[9]

- Methyl sulfides
 - methylmercaptan/methanethiol (MM)
 - dimethyl sulfide (DMS)
 - dimethyl trisulfide (DMTS)
 - dimethyl disulfide (DMDS)
- Benzopyrrole volatiles
 - indole
 - skatole
- Hydrogen sulfide (H₂S)

(H₂S) is the most common volatile sulfur compound in feces.^[9] The odor of feces may be increased when various pathologies are present, including:^[13]

- Celiac disease
- Crohn's disease
- Ulcerative colitis.^[14]
- Chronic pancreatitis
- Cystic fibrosis
- Intestinal infection, e.g. *Clostridium difficile* infection.^[15]
- Malabsorption
- Short bowel syndrome

Attempts to reduce the odor of feces (and flatus) are largely based on animal research carried out with industrial applications, such as reduced environmental impact of pig farming. See also: [Flatulence#Management](#), odor. Many dietary modifications/supplements have been researched, including:

- Activated charcoal.^[16] (In this study it was found that activated charcoal at a dose of 0.52g four times a day did not appreciably influence the liberation of fecal gases.)
- Bismuth subsalicylate.^[17]
- Chlorophyllin
- Herbs such as rosemary
- *Yucca schidigera*.^[18]
- Zinc acetate.^[18]

1.4 Average chemical characteristics

On average humans eliminate 128 g of fresh feces per person per day with a pH value of around 6.6. Fresh feces contains around 75% water and the remaining solid fraction is 84-93% organic solids.

These organic solids consist of: 25-54% bacterial biomass, 2-25% protein or nitrogenous matter, 25% carbohydrate or undigested plant matter and 2-15% fat. Protein and fat come from the colon due to secretion, epithelial shedding and gut bacterial action. These proportions vary considerably depending on many factors such as mainly diet and body weight.^[19]

The remaining solids are composed of calcium and iron phosphates, intestinal secretions, small amounts of dried epithelial cells, and mucus.^[19]

2 Abnormalities

2.1 Stool analysis (stool sample)

Clinical laboratory examination of feces, usually termed as stool examination or stool test, is conducted for the sake of diagnosis, for example, to detect the presence of parasites such as pinworms and their eggs (ova) or, to detect disease spreading bacteria. A stool culture — the controlled growth of microbial organisms in culture media under laboratory conditions — sometimes is performed to identify specific pathogens in stool. The stool guaiac test (or guaiac fecal occult blood test) is conducted to detect the presence of blood in stool that is not apparent to the unaided eye.

The main pathogens that are commonly looked for in feces include:

- *Bacteroides species*
- *Salmonella* and *Shigella*
- *Yersinia* tends to be incubated at 30 °C (86 °F), which is cooler than usual
- *Campylobacter* incubated at 42 °C (108 °F), in a special environment
- *Aeromonas*
- *Candida* if the person is immunosuppressed (e.g., undergoing cancer treatment)
- *E. coli* O157 if blood is visible in the stool sample
- *Cryptosporidium*
- *Entamoeba histolytica*

Intestinal parasites and their ova (eggs) can sometimes be visible to the naked eye.

2.2 Undigested food remnants

Sometimes food may make an appearance in the feces. Common undigested foods found in human feces are seeds, nuts, corn, and beans, mainly because of their high dietary fiber content. Beets may turn feces different hues of red. Artificial food coloring in some processed foods, such as highly colorful packaged breakfast cereals, can cause unusual coloring of feces if eaten in sufficient quantities.

Undigested objects such as seeds can pass through the human digestive system, and later germinate. One result of this is tomato plants growing where sewage sludge has been used as fertilizer.

2.3 Diarrhea

Main article: [Diarrhea](#)

Diarrhea (or diarrhoea in British English) is the condition of having three or more loose or liquid bowel movements per day.^[20] This condition can be a symptom of injury, disease or foodborne illness and is usually accompanied by abdominal pain. There are other conditions which involve some but not all of the symptoms of diarrhea, and so the formal medical definition of diarrhea involves defecation of more than 200 grams per day (though formal weighing of stools to determine a diagnosis is never actually carried out).

It occurs when insufficient fluid is absorbed by the colon. As part of the digestion process, or due to fluid intake, food is mixed with large amounts of water. Thus, digested food is essentially liquid prior to reaching the colon. The colon absorbs water, leaving the remaining

material as a semisolid stool. If the colon is damaged or inflamed, however, absorption is inhibited, and watery stools result.

Diarrhea is most commonly caused by myriad viral infections but is also often the result of bacterial toxins and sometimes even infection. In sanitary living conditions and with ample food and water available, an otherwise healthy patient typically recovers from the common viral infections in a few days and at most a week. However, for ill or malnourished individuals diarrhea can lead to severe dehydration and can become life-threatening without treatment.

2.4 Constipation

Main article: Constipation

Constipation refers to bowel movements that are infrequent or hard to pass.^[21] Constipation is a common cause of painful defecation. Severe constipation includes obstipation (failure to pass stools or gas) and fecal impaction, which can progress to bowel obstruction and become life-threatening.

2.5 Others

Bile overload is very rare, and not a health threat. Problems as simple as serious diarrhea may cause blood in one's stool. Black stools caused by the presence of blood usually indicate a problem in the intestines (the black color is a sign of digested blood), whereas red streaks of blood in stool usually are caused by bleeding in the rectum or anus.

3 Fecal markers

The feces can be analyzed for various markers that are indicative of various diseases and conditions. For example, fecal calprotectin levels indicate an inflammatory process such as Crohn's disease, ulcerative colitis and neoplasms (cancer).

Also, feces may be analyzed for any fecal occult blood, which is indicative of a gastrointestinal bleeding.

4 Fecal contamination

A quick test for fecal contamination of water sources or soil is a check for the presence of *E. coli* bacteria performed with the help of MacConkey agar plates or Petri dishes. *E. coli* bacteria uniquely develop red colonies at temperature of approximately 43 °C (109 °F) overnight.

Although most strains of *E. coli* are harmless, their presence is indicative of fecal contamination, and hence an increased possibility of the presence of more dangerous organisms.

Fecal contamination of water sources is highly prevalent worldwide, accounting for the majority of unsafe drinking water. In developing countries most sewage is discharged without treatment. Even in developed countries events of sanitary sewer overflow are not uncommon and regularly pollute the Seine River (France) and the River Thames (England), for example.

5 Use as fertilizer



Fresh feces collected from a child for a drying experiment

Human feces have historically been used as fertilizer for centuries, in the form of night soil, faecal sludge, sewage sludge depending on the type of collection system and treatment process. The use of untreated human feces in agriculture poses significant health risks and has in fact contributed to widespread infection with parasitic worms - a disease called helminthiasis, affecting over 1.5 billion people in developing countries.



Feces after drying in an experiment to determine moisture content

When the human feces are treated for pathogen kill and safety precautions are applied according to a multiple barrier concept as stipulated by the **World Health Organization**, then treated human feces can be safely used in agriculture.^[23] The approach to “close the loop” between human excreta (sanitation) and agriculture is also called **ecosan** (ecological sanitation). Examples of toilets types that can be used to collect and treat human feces to a safe level include **urine-diversion dry toilets** as well as **composting toilets**.

6 Paleofeces

Main article: **Paleofeces**

Paleofeces, also known as **coprolites**, are ancient human feces, often found as part of **archaeological** excavations or surveys. Intact feces of ancient people may be found in caves in arid climates and in other locations with suitable preservation conditions. These are studied to determine the diet and health of the people who produced them through the analysis of seeds, small bones, and parasite eggs found inside. They also may be analyzed chemically for more in-depth information on the individual who excreted them, using **lipid analysis** and **DNA analysis**. The success rate of usable DNA extraction is relatively high in paleofeces, making it more reliable than skeletal DNA retrieval.^[24]

7 Society and culture

7.1 Anal cleansing

Main article: **Anal cleansing**

Cultures employ a variety of personal cleansing practices after defecation.

- In **Western** and **East Asian** societies, the use of **toilet paper** is widespread. Other paper products were also used before the advent of flush toilets.
- Some **European** and **South American** countries use a **bidet** for additional cleaning.
- In **South Asia** and **Southeast Asia**, handheld bidets are provided for use in toilets.
- In **Islam**, washing of the anus with water is mandatory. If water is not available, items such as paper, stones, or dried leaves can be used.
- In **India**, the anus is also washed with water.
- In the **United Kingdom**, the **Indian toilet** was adapted as the “**WC**” (water closet) and widely deployed in Britain during the reign of **Queen Victoria**.

London suffered numerous outbreaks of **food poisoning** resulting from workers handling food after using the toilet. Cleansing of the anus was an arbitrary practice left to personal choice and facilities available.

- In **Ancient Rome**, a communal sponge was employed. It was rinsed in a bucket of salt water or vinegar after use.
- In **Japan**, flat sticks were used in ancient times, being replaced by toilet paper as the country became more Westernized. Toilets in Japan may include built-in bidets for anal cleansing with warm water.
- In **South Brazil**, during the beginning of the nineteenth century, families of immigrants had little resources and used **corn cob**.

8 See also

- **Defecation**
- **Fecal-oral route**
- **Scatology**

9 References

- [1] Lewis SJ, Heaton KW (1997). “Stool form scale as a useful guide to intestinal transit time”. *Scand. J. Gastroenterol.* **32** (9): 920–4. doi:10.3109/00365529709011203. PMID 9299672.
- [2] “Constipation Management and Nurse Prescribing: The importance of developing a concordant approach” (PDF). Archived from the original (PDF) on 2006-07-05. Retrieved 2006-11-06.
- [3] Hall, John (2011). *Guyton and Hall textbook of medical physiology* (12th ed.). Philadelphia, Pa.: Saunders/Elsevier. p. 798. ISBN 978-1-4160-4574-8.
- [4] Dugdale, David (2009-11-01). “Bloody or tarry stools”. National Institutes of Health. Retrieved 2009-11-30.
- [5] “Fact Sheet: Prussian Blue”. Centers for Disease Control and Prevention. 2006-05-10. Retrieved 2009-11-30.
- [6] <http://cnx.org/content/m14979/latest/>
- [7] <http://www.livestrong.com/article/472989-can-licorice-cause-discolored-stools/>
- [8] Hiele, M; Ghoo, Y; Rutgeerts, P; Vantrappen, G; Schoorens, D (June 1991). “Influence of nutritional substrates on the formation of volatiles by the fecal flora.”. *Gastroenterology.* **100** (6): 1597–602. PMID 2019366.

- [9] Tangerman, A (Oct 15, 2009). "Measurement and biological significance of the volatile sulfur compounds hydrogen sulfide, methanethiol and dimethyl sulfide in various biological matrices.". *Journal of Chromatography B*. **877** (28): 3366–77. doi:10.1016/j.jchromb.2009.05.026. PMID 19505855.
- [10] Chavez, C; Coufal, CD; Carey, JB; Lacey, RE; Beier, RC; Zahn, JA (June 2004). "The impact of supplemental dietary methionine sources on volatile compound concentrations in broiler excreta.". *Poultry science*. **83** (6): 901–10. doi:10.1093/ps/83.6.901. PMID 15206616.
- [11] Geypens, B; Claus, D; Evenepoel, P; Hiele, M; Maes, B; Peeters, M; Rutgeerts, P; Ghoois, Y (July 1997). "Influence of dietary protein supplements on the formation of bacterial metabolites in the colon.". *Gut*. **41** (1): 70–6. doi:10.1136/gut.41.1.70. PMC 1027231. PMID 9274475.
- [12] Otto, ER; Yokoyama, M; Hengemuehle, S; von Bermuth, RD; van Kempen, T; Trottier, NL (July 2003). "Ammonia, volatile fatty acids, phenolics, and odor offensiveness in manure from growing pigs fed diets reduced in protein concentration.". *Journal of animal science*. **81** (7): 1754–63. PMID 12854812. Cite uses deprecated parameter lcoauthors= (help)
- [13] Dugdale, David C. "'Stools - foul smelling'" on Medline Plus". U.S. National Library of Medicine. Retrieved 21 October 2012.
- [14] Levine, J; Ellis, CJ; Furne, JK; Springfield, J; Levitt, MD (January 1998). "Fecal hydrogen sulfide production in ulcerative colitis.". *The American journal of gastroenterology*. **93** (1): 83–7. doi:10.1111/j.1572-0241.1998.083_c.x. PMID 9448181.
- [15] Bartlett, John G.; Gerding, Dale N. (15 January 2008). "Clinical Recognition and Diagnosis of Infection". *Clinical Infectious Diseases*. **46** (s1): S12–S18. doi:10.1086/521863.
- [16] Suarez, FL; Furne, J; Springfield, J; Levitt, MD (January 1999). "Failure of activated charcoal to reduce the release of gases produced by the colonic flora.". *The American journal of gastroenterology*. **94** (1): 208–12. doi:10.1111/j.1572-0241.1999.00798.x. PMID 9934757.
- [17] Suarez, FL; Furne, JK; Springfield, J; Levitt, MD (May 1998). "Bismuth subsalicylate markedly decreases hydrogen sulfide release in the human colon.". *Gastroenterology*. **114** (5): 923–9. doi:10.1016/s0016-5085(98)81700-9. PMID 9558280.
- [18] Giffard, CJ; Collins, SB; Stoodley, NC; Butterwick, RF; Batt, RM (Mar 15, 2001). "Administration of charcoal, *Yucca schidigera*, and zinc acetate to reduce malodorous flatulence in dogs.". *Journal of the American Veterinary Medical Association*. **218** (6): 892–6. doi:10.2460/javma.2001.218.892. PMID 11294313.
- [19] Rose, C.; Parker, A.; Jefferson, B.; Cartmell, E. (2015). "The Characterization of Feces and Urine: A Review of the Literature to Inform Advanced Treatment Technology". *Critical Reviews in Environmental Science and Technology*. **45** (17): 1827–1879. doi:10.1080/10643389.2014.1000761. ISSN 1064-3389.
- [20] "Diarrhoea". *World Health Organization*.
- [21] Chatoor D, Emmnauel A (2009). "Constipation and evacuation disorders". *Best Pract Res Clin Gastroenterol*. **23** (4): 517–30. doi:10.1016/j.bpg.2009.05.001. PMID 19647687.
- [22] Joshi, S.; Lewis, S. J.; Creanor, S.; Ayling, R. M. (2009). "Age-related faecal calprotectin, lactoferrin and tumour M2-PK concentrations in healthy volunteers". *Annals of Clinical Biochemistry*. **47** (Pt 3): 259–263. doi:10.1258/acb.2009.009061. PMID 19740914.
- [23] WHO (2006). WHO Guidelines for the Safe Use of Wastewater, Excreta and Greywater - Volume IV: Excreta and greywater use in agriculture. World Health Organization (WHO), Geneva, Switzerland
- [24] A Molecular Analysis of Dietary Diversity for Three Archaic Native Americans. Hendrik N. Poinar et al. PNAS 10 April 2001: 98 (8) 4317-4322. [DOI 10.1073/pnas.061014798]

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Perez, Antoinner, MusicObsesser4eva, SkarosTroll, Klgray00, Rytyho usa, Naskene, BattyBot, Naughty.librarian, David.moreno72, Cimorcus, Cyberbot I, Jerichojeck, ChrisGualtieri, Otis goodall, TylerDurdan8823, Siuenti, Dexbot, Kawaii136, Skronie, Lugia2453, Wudumindif, Frosty, SFK2, Bertie Old Fellow, Pingu5555, Nicereddy, Maxmoefoe is awesome, Way2veers, Iztwoz, Jakezilla101, Joelupher, Kharkiv07, Ginsuloft, Trololol2254, Andrew daddo, Thehorsesayshello123, Glennlog22, Bennyadrean, Poop5591, Ausmccla3, Welcomemein, A i blyth, RealLucror, Monkbot, Patient Zero, Filedelinkerbot, Raied.rana, Bordwall, SantiLak, BethNaught, CameronCum-mings10, Jo Leffingwell, -MARSHMELLOWxPUPPIES-, NextGenSam619, Turkishyogurt, Doughrash, Czeer, EvMsmile, EChastain, Eteethan, Croatianfan, JMWt, Mattster3517, Goetj44, Cameron812, Flavoredmichael, Sro23, Aammoogghh, Brandonwiki25, Sudpiop, Entranced98, Sejwalpankaj, Anonymous137284, Sof811, Joshfarraday, Gh2d2bvs2d and Anonymous: 895

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