

or on equipment is quite difficult to confirm using human senses. In such situations, the smell, taste and colour of the *najis* can't be easily identified especially if its amount is relatively minute. Microbiological analysis could be used to verify the contamination of *najis mutawassitah* in halal food handling, preparation and storage facilities.

Microorganisms in *Najis Mutawassitah*

Since *najis mutawassitah* originates from unclean or filthy matter, it contains a considerable amount and many types of microorganisms. For example, bacteria that are present in human faeces include *Bacteroides fragilis*, *Bacteroides melaninogenicus*, *Bacteroides soralis*, *Lactobacillus*, *Clostridium perfringens*, *Clostridium septicum*, *Clostridium tetani*, *Bifidobacterium bifidum*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Escherichia coli*, *Salmonella enteritidis*, *Salmonella typhi*, *Klebsiella species*, *Enterobacter species*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Peptostreptococcus species*, *Peptococcus species* and *Methanogens*. There could be about 400 billion of bacteria present in 1 gram of human faeces. An estimate of microbial pathogens that are present in the manure of humans and several animals are shown in Table 1. Other types of *najis mutawassitah*, like urine, blood, vomit and pus, also contain many pathogens.

Table 1 Estimation of microbial pathogens in manure (per gram) of human and some animals.

Organism	Coliforms	Strep	Clostridium	Bacteroides	Lactobacilli
Human	13,000,000	3,000,000	1580	5,000,000,000	630,000,000
Cow	230,000	1,300,000	200	< 1	250
Sheep	16,000,000	38,000,000	199,000	< 1	79,000
Pig	3,300,000	84,000,000	3980	500,000	251,000,000
Chicken	1,300,000	3,400,000	250	< 1	316,000,000
Dog	23,000,000	980,000,000	251,000,000	500,000,000	39,600
Cat	7,900,000	27,000,000	25,100,000	795,000,000	630,000,000