

The scours, the trots - diarrhoea by any other name still won't smell sweet - and chances are high it'll be caused by gastroenteritis.

' Tummy upset episodes are massively under-reported in New Zealand. Public health researchers suspect roof-collected rainwater could be the silent source of gastrointestinal infections on farms and lifestyle blocks around the country. Around 10% of the population relies solely on roof-collected rainwater systems. This number is increasing as lifestyle blocks sprout up and urban dwellers install auxiliary tanks to supplement their supply – particularly in areas where water meters are being installed. A five-year study investigating rainwater from 560 roofs around NZ found more than 50% exceeded minimum standards for faecal contamination and 30% of samples measured heavy contamination. Contamination comes from birds, frogs, rodents and possums along with the occasional dead animal or bird and insects either on the roof, in the gutter or in the tank. The level of faecal contamination was measured by testing for total coliforms and E coli, gastrointestinal infection-causing bacteria commonly used as indicators of water contamination. Gastroenteritis can be caused by a range of viruses, toxins and bacteria - notably pathogens such as Salmonella, Campylobacter, Giardia and Cryptosporidium. The poor reporting of gastroenteritis in NZ, with only one case being notified from every 219 cases of infection in the community, means it is difficult to identify the cause – whether food borne, water borne or caught through direct contact with the pathogen. Most people tend to self- medicate or ride out the storm of gastro-bugs and the incident is never reported. More notice tends to be paid to vomiting and diarrhoea if visitors get a dose of the bug. Outsiders can be more susceptible to water-born bugs because they don't have the same level of accrued immunity to the contaminated water. Tanks should be inspected annually and cleaned out if necessary. Visitors or young people getting tummy upsets should trip alarm bells and encourage action on the part of the householder.

Preventing contamination reaching the tank and cleaning it out periodically is a good place to start in minimizing infections from water-borne stomach upsets, Massey University researchers found. Significant numbers of the heavily contaminated roof water systems were poorly maintained, not adequately disinfected and had no physical measures installed to keep the water clean, says microbiology lecturer and director of the Roof-water Research Centre in Wellington, Stan Abbott. There are simple ways of protecting the tank from contamination, he says. A first flush diverter should be mandatory on every system so that the first contaminated rainwater after a period of dry weather is discarded. It flushes off the built-up dust, bird poop and dead animals rather than moving them into the tank. A rule of thumb is to divert the equivalent of 2mm of rain over the area of the roof, around 100 litres for an average-sized roof. Keeping the roof and gutters clear of moss, lichen, leaves and debris saves a lot of detritus entering the tank – a gutter guard and screen at the top of the downpipe diverts leaf and litter away from the tank. A calmed inlet pipe into the tank sends the water through a U-bend so it doesn't disturb the sediment at the bottom of the tank and a floating out- take pipe takes water from the top of the tank, rather than from down by the sediment.

Tanks should be inspected annually and cleaned out if necessary - by a professional, or by using a swimming pool vacuum cleaner or a tank vacuuming system. Shock dosing of

a tank after a contamination can be done but Abbott recommends using a stabilised hydrogen peroxide product. It is safer and less corrosive than a sodium hypochlorite bleach. A range of commercial hydrogen-peroxide products that can't be overdosed is available on the market. While disinfection of a rainwater tank could be used as a temporary remedial measure, Abbott says it is far better to install some of the physical methods to ensure water quality as any chemical disinfectant of a tank will inevitably be diluted by rainfall until no chemical remains in the tank. H

Reporting pyramid for acute gastro intestinal infections in NZ2006

Symptoms: diarrhoea, stomach cramps, vomiting, nausea, headache, flatulence.

Source: Massey University

Preventive measures for safe roofwater harvest and storage

Screened rainhead

First flush diverter

Calmed inlet

Floating out-take

Tank vacuum device