

GREEN OR OBSCENE

“ We’ve been separating humans from human effluent for 100 years. Why reverse 100 years of good public health policy?”

Cattle farmer Ron McIntosh, on his farm in Stratford NSW, has been using Biosolid fertilisers for the past 10 years

Ron McIntosh has been running beef and dairy cattle on his Stratford farm for four decades and brags that his 200ha farm nestled at the bottom of the Barrington Tops is lush and noticeably greener than surrounding farms. He puts that down to the fertiliser he has been using.

Human excrement. Every year for the past 12 years, 800 tonnes of biosolids, the semi-solid sludge left over from Newcastle’s sewage-treatment works, have been ploughed into his fields.

“Our milk was top quality and the rye and general pasture have more sugars and proteins in it. It’s a very valuable fertiliser,” the 62-year-old says about the free fertiliser that is part of Sydney Water’s solution to ridding the state of millions of tonnes of sludge.

McIntosh’s cattle may be happy, but back in Sydney, prominent doctor Kerry Phelps has called for an inquiry into the use of biosolids as she is convinced she is witnessing a new epidemic of patients with gastrointestinal illnesses usually seen in Third World countries.

And not just one bug, but a combination of them. Blastocystis hominis, a parasite that can cause stomach cramps, bloating and diarrhoea, and Dientamoeba fragilis, another parasite, plus giardia.

“It was the combination of three or four different bugs, it was an unusual pattern and GPs see an epidemic first,” Phelps says. The bugs were most commonly found in human faeces.



JANE HANSEN

Over at the Centre for Digestive Diseases in Concord, Dr Thomas Borody agrees there is a parasitic epidemic of sorts going on, having seen 1200 cases over the past 10 years.

“It is an eye-opener as to how many of my patients have these parasites.

There were four just confirmed overnight and eight to 12 a week,” he says. Borody suspects contaminated water sources, but Phelps is suspicious of Sydney Water’s biosolid program that annually turns 180,000 tonnes of human waste into fertiliser.

She wants to know if human excrement used on farms may be making its way into the food source.

The liquid component of what’s flushed and forgotten in millions of NSW households daily can be safely treated and returned to the environment. But the solids, or sludge which used to be dumped offshore, pose a major pollution problem. In 1997, Sydney Water began its



composting and recycling program to turn the sludge into a "nutrient-rich organic material" that is "100 per cent beneficially used in agriculture, composting and land rehabilitation" according to its website.

The biosolids, as they are known, are composted with green waste and the natural heat generated by composting is supposed "to reduce pathogens".

Private contractors pick up the biosolids and distribute them to licensed farms throughout the state.

The private contractors are responsible for ensuring the fertiliser is ploughed in and guidelines adhered to.

According to Environmental Protection Authority guidelines, if biosolids are used on agricultural land, crops — from potatoes to lettuce and turf — should not be grown for between 18 months and five years.

There is also a 30-day harvesting rule for animal feed and fibre crops.

Sydney Water told *The Sunday Telegraph* biosolids were used on 20 farms in NSW, which were mostly crops and pasture.

"The biosolids are spread and incorporated into the soil prior to sowing. The harvested components of these crops don't come into contact with the soil/biosolids mixture. These crops are also mostly reprocessed," a Sydney Water spokesperson said.

When Phelps began digging, she found Sydney Water's biosolid treatment did not kill pathogens, "just reduce them". "I thought if they were using waste, it should be completely disinfected, but it's not," she says.



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DR THOMAS BORODY

Tests obtained by *The Sunday Telegraph* found *D. fragilis* in primary waste water, but more disturbingly, blastocystis and salmonella were found in samples of treated biosolids obtained from one of the east coast's largest contractors. Microbiologist Glen Pinna of Biotech Laboratories that did the tests said the fertiliser was a biohazard.

"I would have concerns for anyone who used it directly on crops, and I would be very concerned if this material was used as fertiliser," he said.

Drivers who deliver biosolids to farms, including dairy and sugar-cane farms, also reported a high incidence of gastrointestinal illness and eye infections. International studies, published in medical and public-health policy journals, have found residents living near land where biosolids are used suffer a higher rate of illness.

"It is a very short line from pathogens proven to be found in biosolids to the farm to the pathogens appearing in the human gut," Phelps says. "We appear to have a very big public-health issue here."

NSW Health assured the public the biosolids program was safe after *The Sunday Telegraph* exposé. Centre for Health Protection director Dr Jeremy McAnulty, part of the hastily convened panel of experts set up to review the program, said strict guidelines governed by the EPA ensured safety.

McAnulty said biosolids were only used on grain and feed crops, but added that all fertilisers carried pathogens and, as a good measure, people should "wash their vegetables".

But there are serious questions being asked about the adequacy of the monitoring, Sydney Water refused to tell NSW Health where the biosolids went, citing commercial confidentiality, and the EPA, charged with overseeing the safety guidelines, didn't know either when Agenda inquired.

"Under the guidelines, biosolid processors are not required to provide



You put all those organisms and antibiotics together and the bugs respond by mutating and developing resistance
PROFESSOR PETER COLLIGNON

us with lists of their customers," a spokesperson said. Phelps says: "They say there are all these guidelines, but no one is testing, and no one knows where it is being used."

Microbiologist and infectious diseases expert Professor Peter Collignon says separating humans from their own waste has been the single biggest advance in health policy, one that was now being undone.

"We've been separating humans from human effluent for 100 years and whenever you reverse that principle, it is a high-risk product," Collignon says. Food and faeces are a bad mix. In Europe last week, as many 16



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DR KERRYIN PHELPS

mercury, arsenic, cadmium and lead, were detected in all samples. Also in the mix were 72 pharmaceutical products such as the antibiotics ciprofloxacin and vancomycin and the anti-bacterial fungicide triclocarban.

Collignon, who works at the Australian National University, is alarmed by the cocktail of bugs and antibiotics the US studies exposed. He says it's a recipe for resistant bacteria — superbugs. "You put all those organisms and antibiotics together, especially with ciprofloxacin that does not degrade, and the bugs respond by mutating and developing resistance." Leena Sahlstrom from the Finnish



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GLEN PINNA, MICROBIOLOGIST

collapse of a population of fish in an isolated lake spiked with relatively high levels of a synthetic oestrogen.

A 2008 study found earthworms from fields where biosolids had been spread as fertiliser had measurable amounts of pharmaceuticals in their bodies. Another study showed dioxins could get into milk if cows fed on pastures grown in biosolids.

"The use of sludge on land used to graze animals appears likely to result in increased human exposure to PCDD/F," the British Columbian university study concluded.

The NSW EPA's 92-page guidelines state that if biosolids are used on agricultural land, crops should not be grown for between 18 months and five years. There is also a 30-day harvesting rule for animal feed and fibre crops.

On McIntosh's farm, recycling company Arkward, which distributes biosolids up and down the east coast, delivers 30 truckloads a year.

"It goes on the field, it has to be ploughed in and they come and test the soil for heavy metals," McIntosh says. "It's a very valuable fertiliser and we've had good results with our feed crops of rye and oats."

McIntosh has had his own concerns about regulations because a few years back, a truck dumped 25 tonnes of what appeared to be untreated sludge on his property in the middle of the night without his knowledge.

McIntosh never got the bottom of it. But his regular use of biosolids has upset the neighbours and he admits he has been investigated by the EPA.

"Two years ago they came out and found my levee banks were not high enough — they were, but they had sunk," he says.

The levee banks are important because they stop the biosolids leaching into the water course.

"We have striven to keep effluent out of water and off foods. Why reverse 100 years of good public health policy?" Collignon says.

It's a very short line from pathogens found in biosolids, to the farm, to pathogens appearing in the human gut

people died from haemolytic-uraemic syndrome (HUS), a disease caused by a strain of bacteria known as E-coli, a bug found in human faeces.

The original suspected source — "organic" cucumbers imported from Spain — have been cleared, but German authorities have warned people to avoid eating raw cucumbers, tomatoes and lettuce.

The use of biosolids is banned in Austria and Switzerland. Germany and Sweden refuse to stock products grown in biosolids.

There are little, if any, publicly available studies in Australia about what is actually in biosolids, and how they might affect the population.

However, the US EPA has publicly released details that show biosolids are a stew of heavy metals and leftover or residual pharmaceuticals. The 2009 National Sewage Sludge Survey Report found dioxins and hormone disrupting PCBs and 27 different heavy metals like

Food Safety Authority, along with Swedish scientists, tested the superbug theory at a waste-water treatment plant in Uppsala county, Sweden, in 2009.

"Resistance genes can spread from animals, through the food chain, and back to humans. Sewage sludge may act as the link back from humans to animals," the scientists proposed after finding 79 per cent of samples of sludge contained vancomycin-resistant enterococci or VRE.

"This implies a risk of antimicrobial resistance being spread to new farms and to the society via the environment if the sewage sludge is used on arable land," Sahlstrom concluded.

The US EPA tests also found 25 steroids and hormones, including synthetic oestrogen, in all 84 samples.

The EPA admitted these compounds were not affected by the treatment process, and there is already evidence they can enter the food chain.

In May 2007, scientists showed the

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