An engaging test of disinfection strategy

Measuring the aesthetic preferences of drinking water

In October 2018, the disinfectant in the drinking water system of Myponga, South Australia was changed from free chlorine to monochloramine for aesthetic improvement and improved compliance with the Australian Drinking Water Guideline. The change to chloramination in Myponga township in 2018 has achieved a better aesthetic result, with 86 per cent of the township satisfied with the chloraminated water, up 6 per cent.

With the significant increase in those who thought the taste and smell of the drinking water supply at Myponga had improved following the switch to monochloramine, we wanted to test if this reported aesthetic improvement would also be reflected in the wider South Australian community.

Our approach

We invited members of the wider community to participate in a blind tap water taste test, asking them to rate the waters tested using a five-point scale (Figure 2).

Figure 2: Modified Flavour Rating Assessment scale.

At the Science Alive interactive science exhibition, participants were invited to test five different water samples (Image 2).

Citizen science is a fun engagement model that talks openly and honestly with our customers about water quality. By finding out which tap waters people prefer and why, we are able to more deeply understand and so better respond to people's perceptions.

Image 2

Participants were invited to taste water samples subject to various treatments from different water sources in South Australia:

- Myponga free chlorine
- Myponga chloraminated
- Metropolitan Adelaide 1
- Metropolitan Adelaide 2 (control)
- Groundwater (outlier)

Participants of Myponga were excluded from the taste test.

Aesthetic preferences

Over three days, 250 blind taste tests were conducted (Table 1). The tap water taste test provided greater insights into aesthetic preferences and how different drinking waters aesthetically compare for our customers.

Water flavour rating on each day of event (/5)					
Day	Metropolitan Adelaide 1	Metropolitan Adelaide 2	Myponga chloraminated	Myponga free chlorine	Groundwater
1	3.80 (0.11)	3.79 (0.11)	3.51 (0.11)	3.16 (0.13)	1.49 (0.09)
2	3.85 (0.13)	4.06 (0.11)	3.37 (0.14)	3.15 (0.15)	1.69 (0.12)
3	3.77 (0.12)	3.61 (0.13)	3.65 (0.12)	3.32 (0.13)	1.71 (0.12)

Table 1: Water flavour rating mean rating (± standard error).

Data demonstrated a preference for Metropolitan Adelaide water, but chloraminated Myponga water was not rated significantly different from Adelaide metropolitan water.

Chloraminated Myponga water rated significantly higher than chlorinated Myponga water. Freely chlorinated Myponga water consistently rated less acceptable.

Chlorine was shown to have a 4-fold greater adverse effect on acceptance.

Groundwater high in chlorine and total dissolved solids is aesthetically challenging and was removed from analysis (Table 2).

Chlorine over 3-day event (mg/L)				
Water	Free	Monochloramine	TSD (mg/L)	Hardness (mg/L)
Metropolitan Adelaide 1	BDL*	BDL*	252	109
Metropolitan Adelaide 2	BDL*	BDL*	252	109
Myponga free chlorine	BDL*	2.46 - 2.20	336	120
Myponga chloraminated	1.32 - 0.85	0.11 - 0.14	325	123
Groundwater	0.67 - 0.46	BDL*	1003	490

Table 2: Water quality of the waters tasted. *Below detection limit.

Future operational and treatment changes will continue to keep customers' preferences front-of-mind to ensure high aesthetic acceptability.

Want to hear more?

Come and have a chat with Dr Kelly Newton from SA Water at Stand P14, or visit us online sawater.com.au

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