



In short

- Fish excrete ammonia. Filter bacteria convert it to nitrite, then to nitrate. Both intermediate steps are toxic to koi.
- Your test kit reads total ammonia. Only part of that is free ammonia (NH3), the toxic form, and that share climbs steeply with higher pH and warmer water.
- The same 1.0 ppm reading is a non-event at pH 7.0 and 59 °F, and an emergency at pH 8.5 and 82 °F.
- Nitrite should read zero. It blocks the blood from carrying oxygen, and salt at the correct dose is the recognized protective measure while the filter recovers.

PH	59 °F (15 °C)	68 °F (20 °C)	77 °F (25 °C)	82 °F (28 °C)
7.0	0.3%	0.4%	0.6%	0.7%
7.5	0.9%	1.2%	1.8%	2.2%
8.0	2.7%	3.8%	5.4%	6.5%
8.5	7.9%	11%	15%	18%
9.0	21%	28%	36%	41%

The classic misread runs like this: a keeper sees ammonia present, reads that low pH reduces its toxicity, and deliberately drops the pH. It does reduce free ammonia, but it also slows the nitrifying bacteria that are your only real way out, and if alkalinity is already thin the pH will not stop where you wanted it. Dilute the ammonia with clean water instead of chasing pH downward.

What H2Koi does, and what it does not. The sonde sits in the pond and measures continuously. Directly measured: temperature, pH, dissolved oxygen in mg/L and percent saturation, conductivity, turbidity, ammonium (NH4), and nitrate (NO3). ORP is available as an option. Derived from those measurements: free ammonia (NH3), nitrite, carbonate hardness on a 0 to 20 dKH scale, salinity, TDS. That distinction matters on this page in particular. NH3 is computed from the measured ammonium together with pH and temperature, which is exactly the calculation this article asks you to do by hand, run continuously instead of weekly. Nitrite and KH are likewise derived figures, not titrations, and general hardness (GH) is not reported at all. A self-cleaning wiper keeps the optical sensors clear. What this gives you is continuous early warning from industrial-grade sensors. It does not detect disease or parasites, and it will not stop a spike from occurring. It shortens the time between something going wrong and you knowing about it. We also build bespoke automated water change systems for ponds that need them; we have never found another system that does it, and neither have our clients.