



WATER CHEMISTRY GUIDES

Salt is one of the oldest tools in koi keeping and one of the most commonly misused. Used deliberately, at a level you have actually measured, it is genuinely useful. Added by the bucket because the fish look off, it quietly stacks up in a pond that has no way of getting rid of it.

In short

- The best-evidenced use of salt is protection against **nitrite** toxicity. Chloride competes with nitrite for uptake at the gills, which makes salt the standard first response while a struggling filter recovers.
- Roughly **0.1–0.3%** (1–3 kg per 1000 liters, or about 0.8–2.5 lb per 100 gallons) is the general supportive range. Up to about **0.5%** is used for short therapeutic periods, under advice.
- **Salt does not evaporate and is not consumed.** It leaves only by water change or dilution. Dosing repeatedly without measuring is how keepers end up far past where they think they are.
- Calculate from a known pond volume, then verify with a meter. Salt raises conductivity, which is how it is measured in practice.

What salt actually does

Three separate jobs get bundled under the word "salt," and they call for three different levels. Keeping them apart is most of the skill.

As a general tonic. At low levels, salt slightly reduces the osmotic work a koi does to hold its internal balance against fresh water. Fish under stress from handling, shipping, or a rough spell of water quality often settle better with a small amount of salt in the system. This is supportive, not curative.

Against certain external parasites. At higher, short-term levels, salt disrupts the osmotic balance of some external parasites before it disrupts the fish. This is a real effect, but it is not broad-spectrum. Which parasite you are dealing with matters, and that answer comes from a skin scrape under a microscope, not from a guess. Salting blind because a koi is flashing is a common way to end up with a heavily salted pond and the original problem intact.

Against nitrite toxicity. This is the use with the strongest support, and the one worth understanding properly.

The nitrite case, and why salt is the standard first move

Nitrite crosses the gill membrane through the same pathway the fish uses to take up chloride. Once in the bloodstream it binds hemoglobin and blocks it from carrying oxygen, so the fish effectively suffocates in water that has plenty of oxygen in it. Raise the chloride level in the pond and you raise the competition at that uptake site, so less nitrite gets in.

That makes salt the sensible holding action whenever ammonia and nitrite are climbing: a new pond cycling, a filter knocked back by medication or a cold snap, a sudden stocking increase. Salt buys the fish time. It does not fix the filter. Alongside it you still want feeding cut back, aeration up, and steady water changes to hold the nitrite down while the bacteria catch up.

Salt does not lower nitrite. It protects the fish from the nitrite that is there. A pond that looks calm on salt can still be sitting on a nitrite reading that would be lethal without it, and the moment that salt is diluted out by water changes the protection goes with it. Treat the salt as a bandage and the filter as the wound.

How much salt, and for how long

Treat these as well-established working ranges, not as a prescription. Confirm the target against the advice you are following for your particular situation, and measure what you actually end up with.

LEVEL	PPT	PPM	APPROX. PER 100 GAL	TYPICAL USE
0.1%	1	1,000	~0.8 lb (1 kg / 1000 L)	Light supportive level; some nitrite protection
0.2%	2	2,000	~1.7 lb (2 kg / 1000 L)	General tonic and stress support
0.3%	3	3,000	~2.5 lb (3 kg / 1000 L)	Upper end of the general range; nitrite events
0.5%	5	5,000	~4.2 lb (5 kg / 1000 L)	Short therapeutic period only, under advice

Above that range, and at any level held for a long stretch, the salt itself becomes the stressor. Sustained high salinity is work for the kidneys, and a koi kept in it for months is not being supported, it is being taxed. Come down deliberately once the reason for the dose has passed.

Two practical notes. Dissolve the salt in a bucket of pond water and pour it in over the return flow rather than dumping crystals in, so no fish sits in a pocket of concentrate. And bring the level up over several hours rather than all at once. Warm water holds less oxygen and dissolved salt reduces gas solubility slightly, so during any therapeutic dose in summer, run extra aeration and keep an eye on dissolved oxygen. Above about 75°F (24°C) that is not optional.

The mistake that causes real harm

Salt does not evaporate. It is not consumed by the filter, not taken up by the fish in any meaningful quantity, and not broken down. When water evaporates on a hot week the salt stays behind and the concentration goes *up*. The only route out is physical removal of water: a water change, a leak, a drain-down.

So the keeper who adds "a couple of scoops" in April, again in June when a fish looks off, again in August after a filter wobble, and tops off evaporation with fresh water in between, is not sitting at 0.1%. They may be well past 0.5% and have no idea, because nothing in the pond announces it. The fish get quieter, they eat less, and the natural response is to add more salt.

Never dose by the bucket. Work out your pond volume once, properly, including the filter and any settlement chamber, and write it down. Calculate every dose against that number. Then confirm the result with a salinity meter before you decide the job is done. If you cannot state your current salt level in ppm, you are not in a position to add more.

Getting salt back out

Dilution is the only lever, and it is a slower one than most people expect, because each change removes a proportion of what remains rather than a fixed amount. Starting from 0.3%:

20% CHANGES DONE	SALT REMAINING	PPM
1	0.24%	~2,400
2	0.19%	~1,900
3	0.15%	~1,500
5	0.10%	~1,000
8	0.05%	~500

The corollary matters just as much in the other direction: if you are holding a target level, only the *replaced* volume needs re-dosing, not the whole pond. Topping off evaporation needs no salt at all. Get that backwards and the level climbs every week.

This is one of the places where automated water changes earn their keep. Small, continuous exchange makes dilution a background process instead of a weekend project. H2Koi also builds bespoke automated water change systems, and we have never found another system that does it, and neither have our clients.

Which salt, and what it costs you elsewhere

Use pure sodium chloride with nothing else in the bag. No iodine, no anti-caking agents, no rust inhibitors, no dyes. Solar salt and additive-free water softener crystals are the usual choices in the US, but read the bag rather than the shelf label, and be wary of pellets and anything listing YPS or similar. Kosher or plain non-iodized food salt is fine, just expensive at pond volumes.

WHAT SALT DOES	WHAT SALT DOES NOT DO
Reduces nitrite uptake at the gills	Lower ammonia or nitrite in the water
Supports osmotic balance in stressed fish	Cure bacterial infection or ulcers
Kills some external parasites at higher levels	Treat every parasite, or replace a diagnosis
Raises conductivity, so it is measurable	Leave on its own, or stabilize pH

Two side effects to plan for. Salt harms many pond plants at therapeutic levels, and the marginal and floating planting that softens a koi pond is usually the first to go. If a full dose is coming, move what you can into a holding tub. Second, salt does nothing for buffering. It will not protect you from a pH crash, and it does not substitute for keeping carbonate hardness (total alkalinity on US test kits) where it belongs. A pond on salt with no KH reserve is still one heavy rain away from trouble.

Why spot-checking leaves a gap

Salt is a slow, cumulative variable, which is exactly the kind that periodic testing handles worst. Nobody checks salinity weekly. Most keepers check it when they dose, if then, and the meter goes back in the drawer. In between, evaporation concentrates it, top-offs and water changes dilute it, and a second dose lands on a baseline nobody measured. Meanwhile the reading that actually justified the salt in the first place, nitrite, is also moving between checks. A filter can lose ground on a Tuesday and be flagged on Saturday. The salt you added in spring is either still protecting the fish or has been diluted to nothing, and a monthly test tells you which only in hindsight.

What H2Koi does and does not do here. H2Koi measures conductivity directly and continuously, and reports salinity and TDS as derived values, so a rising or falling salt level is visible as a trend rather than guessed at between checks. It also measures temperature, pH, dissolved oxygen, turbidity, ammonium (NH₄) and nitrate (NO₃) directly, with ORP available as an option, and reports nitrite, ammonia (NH₃), KH. General hardness (GH) is not reported at all. A self-cleaning wiper keeps the sensors clear.

It is early warning from industrial-grade sensors. It cannot see a parasite, diagnose a disease, or tell you why a koi is flashing. And when you are placing a therapeutic dose, confirm the number with a dedicated salinity meter, because this is a case where the exact figure matters and a derived value is the wrong thing to lean on.

Frequently asked questions

How much salt do I put in my koi pond?

For general support, roughly 0.1–0.3% (1,000–3,000 ppm), which is about 0.8–2.5 lb per 100 gallons, or 1–3 kg per 1000 liters. Short therapeutic use goes up to about 0.5% under advice. Calculate against a known pond volume rather than a guess, add it dissolved and over several hours, and confirm the result with a meter.

How long does salt stay in a koi pond?

Indefinitely. Salt does not evaporate, degrade, or get used up. It leaves only when water physically leaves, so the level stays put until you dilute it with water changes. If you are only topping off evaporation, the concentration is actually rising.

Can I use water softener salt in my koi pond?

Only if it is pure sodium chloride with no additives. Plenty of softener salt contains anti-caking or rust-inhibiting agents that you do not want in a pond. Read the ingredient panel on the bag, avoid anything with additives listed, and avoid iodized salt entirely.

Will salt kill my pond plants?

At therapeutic levels, many of them, yes. Aquatic plants generally tolerate salt far less well than koi do. A low tonic level is often survivable for hardier species, but before a 0.3–0.5% dose, move potted and floating plants to a holding tub. Do not pour salted pond water onto garden beds or trees either.

Does salt cure ich or parasites on koi?

It is effective against some external parasites at higher short-term levels and useless against others, and it does nothing for bacterial infection. Which one you have determines whether salt is the right call, and that comes from a scrape looked at under a microscope by your vet or a dealer who does it. Salting a pond hoping to hit something is how the level ends up too high with the problem unresolved.

Do I need to add salt after a water change?

Only if you are deliberately holding a salt level, and only for the volume you replaced, not the whole pond. Replace 20% of the water and you have removed 20% of the salt, so re-dose against that 20%. Dosing the full pond volume after every change is one of the fastest ways to stack the concentration past where you intended.

How do I test the salt level in my pond?

Salt raises the water's conductivity, and that is what the instruments read. A handheld digital salinity meter is the practical tool for a koi pond and reads directly in ppt or percent. Calibrate it, and test in the pond rather than in a bucket that has just had salt tipped into it. Continuous conductivity monitoring will show you the trend between checks, but for a therapeutic dose the dedicated meter is the number you act on.

