

Moisture Matters: Understanding Chronic Dehydration in Cats



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Q Why are cats susceptible to dehydration?

A There are multiple reasons why cats may not consume an ideal amount of water.

Evolution. Cats have evolved as obligate carnivores and don't naturally drink water when eating fresh prey or wet food—both of which are about 60% to 70% water.

- When cats eat a dry diet, their thirst drive is reduced.¹ And while cats on dry diets do drink more water than those on wet diets, the amount does not equal the water contained in a wet diet with the same nutrient composition.²
- Cats adjust their water intake to the dry matter content of their diet rather than the diet's moisture content.³ When cats become dehydrated, they can be slow to initiate drinking; compared to dogs, they take almost a day longer to replenish severe fluid deficits.⁴

Physiology and anatomy. Adult cats are not designed to be efficient drinkers of low-viscosity fluids such as water because they cannot create suction with their tongues.

- When they lap a bowl of water, only 3/100 of a teaspoon of water is consumed with each flick of the tongue. Consequently, a lot of lapping is required for a cat to stay hydrated.⁵
- While cats have excellent distance vision, they have poor near-distance vision. This can make it difficult for them to see the meniscus on the surface of their water bowl.

Instinctive behaviour. Cats can feel vulnerable when drinking from a water bowl.

Preferences. Cats are sensitive to the presentation and taste of water and prefer fresh, moving water.

Q How does the form of the diet affect metabolic function in the cat?

A One way to study this is to compare hydration in cats that eat dry diets vs. cats that eat wet diets. A recent study showed that cats fed a wet diet containing 70% moisture had lower urine specific gravity and less weight gain while exhibiting more physical activity than cats fed a dry diet with 10% moisture.⁶ In addition, studies comparing water balance in cats have shown that cats fed wet food had significantly greater water intake per gram of dry matter compared to cats fed dry food.⁷

Do Owners Know How Much Their Cats Are Drinking?

To better understand cat owners and what they know about the hydration needs of their cats, Purina® Pro Plan® conducted a survey of 1,018 U.S. cat owners whose cats visited the veterinarian in the last 12 months.*

The findings?

Cat owners are more likely to assume their cat is drinking rather than actually knowing how much they drink. While **79%** of owners surveyed believe their cats drink enough water each day, only **37%** claim to know how much water their cats need to drink daily.



Veterinarians have an opportunity to initiate hydration conversations. While the veterinarian is the most trusted source of information about cat health and care, just **31%** of owners have discussed their cats' hydration needs with their veterinarian, and **45%** are unaware that dehydration might be related to a secondary health condition.



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*Data was collected by Revelation Research via an online survey from August 13–17, 2019. A total of 1,018 nationally representative cat owners qualified and completed the survey. Qualified participants were men and women age 18 or older, owned one or more adult cats, were household members most responsible for taking the cats to a veterinarian, and had taken the cats to a veterinarian in the past 12 months.

A Simple Solution for Improving Feline Hydration



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Because cats are prone to dehydration, ensuring adequate water intake can be a constant challenge for veterinarians and owners alike. While research has shown that both water intake per gram of dry matter and total water turnover per gram of dry matter increased when cats are switched from eating an all-dry to an all-wet diet,¹ feeding wet food is not an option for every cat, due to both owner and pet preferences. For this reason, scientists at Purina investigated a new method to increase fluid intake: a nutrient-enriched water for feline hydration as complementary pet food.

Nutrient enriched water supplements for cats: Can they help?

Studies were performed to evaluate nutrient-enriched water supplemented with osmolytes (e.g., amino acids and glycerol) to support the absorption of water.²⁻⁴ Drinking volumes, total water intake and various measures of hydration were all quantified in healthy cats.²⁻⁴

- In the first study, indoor cats in home environments had ad libitum access to nutrient-enriched water for 56 days to examine sustained ingestion. The cats increased total daily water intake, resulting in more dilute urine and decreased urine osmolality.²
- In the second study, indoor cats had free access to a specific dose of nutrient-enriched water, offered twice daily, with the volume of liver flavour incrementally increased over a 10-to 17-day period. Cats consumed more liquid by drinking as the volume of liver flavour was increased. In addition, urine specific gravity decreased.³
- The third study evaluated cats that were given brief access to 50 mL of nutrient-enriched water in a clinic setting to evaluate the acute response to liquid ingestion as fluid therapy. The healthy cats in this study drank significantly more water when offered nutrient-enriched water than when offered tap water.⁴



These studies demonstrate that cats not only drink more liquid but maintain a higher level of water intake when given access to nutrient-enriched water.²⁻⁴ In the study with the clinic cats, dose-specific increases in water intake translated into acute increases in hydration and prevented mild, subclinical dehydration.⁴ Because urine volume increased and urine specific gravity decreased in cats, that consumed the nutrient enriched water, these findings suggest that cats in need of greater hydration would benefit from a feline hydration supplement.²⁻⁴

Helping cats get the water they need.

Many situations exist in a cat's daily life that may leave it in a dehydrated state and in need of increased water intake. Recent studies in healthy cats given nutrient-enriched water have begun to provide a greater understanding

of how daily water ingestion impacts hydration and associated physiological parameters. As a result, veterinarians have the opportunity to move beyond the generic recommendation of merely telling clients to keep fresh water available and, instead, provide a product that can increase daily water intake and improve hydration.

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Maintaining Hydration in Cats With CRI



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Dehydration is a common complication of chronic renal insufficiency (CRI) and can lead to inappetence, lethargy, weakness, constipation and increased susceptibility to uraemic crisis.¹ It may also precipitate pathophysiologic responses that have a negative effect on the kidneys.

Dangers of dehydration.

Several physiologic mechanisms are triggered when the body senses dehydration, and chronic subclinical dehydration may result in compensatory effects that ultimately have a negative effect on the kidneys. These pathophysiologic effects include:

- **Release of vasopressin**, which works to increase water reabsorption via increased expression of aquaporin channels in the collecting duct.² This can result in intraglomerular hypertension and potentially the development of proteinuria and systemic hypertension.²
- **Activation of the renin-angiotensin-aldosterone system (RAAS)**, which is another critical component in the pathophysiology and progression of renal condition.³ Normally protective, the RAAS—which regulates blood pressure, fluid and electrolyte balance, and systemic vascular resistance—becomes maladaptive in patients with CRI.

- **Poor perfusion**, which may exacerbate hypoxia at the tissue level in kidneys that are already susceptible due to fibrosis and damaged vasculature.

Therapeutically addressing dehydration may benefit the kidneys by reducing vasopressin secretion, decreasing the activation of RAAS and optimising perfusion.

Rehydration strategies for cats with CRI.

The following strategies can help owners of CRI patients keep their cats appropriately hydrated.

1. Educate clients about hydration.

Explain how to monitor cats for dehydration, including looking for concurrent illnesses, vomiting and diarrhoea. Advise clients to eliminate household stresses that might inhibit their cats from drinking and to provide an adequate water supply. Ensure they understand that quick medical action may be required if they notice these signs, especially for older cats with CRI.

2. Address water balance.

Recommend clients feed wet food instead of dry or add water to food, and provide fresh, accessible water for their cats. Supplementation with free water (orally or with a feeding tube) is preferred

to avoid the excess sodium load that comes with subcutaneously administered electrolyte solutions.

3. Assess for and treat constipation.

The cause of constipation associated with CRI is likely a dysfunction of water balance, so hydration should be dealt with before employing other medical therapies. Potassium deficiency should also be identified and addressed. Following this, oral osmotic stool softeners can help manage constipation. Adding fibre sources such as psyllium may also be useful.

Maintaining hydration is a key therapeutic target in renal insufficiency. By carefully assessing renal patients for hydration status, veterinarians can tailor therapy appropriately.

Key Takeaways

- When dehydration is a concern for a cat, switching the diet to all-wet food or offering a nutrient enriched water alongside the dry diet and fresh water are effective strategies for improving hydration.
- Studies demonstrated that cats given access to nutrient-enriched water not only drink more liquid, but maintain a higher level of water intake.²⁻⁴
- Maintaining adequate hydration—while avoiding overhydration—is a key therapeutic goal for cats with CRI. Patients with renal conditions should be carefully assessed for hydration status so therapy can be tailored appropriately.

Know the risks of overhydration

While the most common water balance issue in patients with CRI is dehydration, overhydration can also be a concern. As kidneys become increasingly damaged, their ability to remove water from the body is compromised, making overhydration an added risk that can result in negative consequences.

Excessive hydration can result in clinically obvious signs such as third-spacing and can have detrimental effects at the level of the kidney parenchyma.

CRI patients in later stages, acute kidney injury or underlying ureteral obstruction may not be able to excrete water the way a patient with normal kidney function would. Likewise, CRI patients who are used to being chronically subclinically dehydrated may also not adjust well to the sudden administration of large volumes of fluid. Use caution when administering fluid therapy because fluid overload can be challenging to resolve without dialysis.



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