


 Vetoquinol
a Sign of Passion

New hope for compromised kidneys



Technical Profile



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Chronic kidney disease (CKD) is the most common form of kidney disease in dogs and cats. It is also one of the most common diseases in older cats. The prevalence of kidney disease is estimated at somewhere between 0.5% and 7% in dogs and between 1.6% and 20% in cats.¹

When CKD is present, there is a decrease in the glomerular filtration rate (GFR) and the kidneys are unable to maintain homeostasis of the blood. Homeostatic balance of water, sodium, potassium, calcium and other salts is no longer possible, and azotemia develops.

Azotemia is defined as an abnormal concentration of urea, creatinine, and other nonprotein nitrogenous substances in blood, plasma or serum. It is a laboratory finding that should not be used as a synonym for uremia.

Uremia is defined as (1) abnormal quantities of urine constituents in the blood caused by primary generalized kidney disease and (2) the polysystemic toxic syndrome (also called uremic syndrome) that occurs as a result of abnormal kidney function.¹

Treatment of CKD generally includes: specific therapy based on a renal diagnosis; prevention and treatment of the complications of reduced kidney function; management of co-morbid conditions; and therapy to slow down the loss of kidney function.

Regardless of the etiology of CKD, it is desirable to reduce levels of uremic toxins in the blood. Until recently, dialysis and renal transplants,

which are costly and relatively uncommon in veterinary medicine, were the only treatment modalities available to achieve this goal.

A number of attempts at treatment have been based on the use of the bowel as a substitute for kidney function. Because of its semi-permeable membrane, the intestinal wall allows small molecules to pass from the intestinal tract into the bloodstream and vice versa. Consequently, nitrogenous wastes, such as urea, creatinine and uric acid, flow into the intestine and equilibrate across the intestinal wall.

In 2006, Vétoquinol USA, Inc. launched **Azodyl™**, a novel patented product based on the principle of Enteric Dialysis® — the process by which beneficial bacteria consume uremic toxins or metabolites present in the bowel.

The bacteria in **Azodyl** are live non-pathogenic microbes that improve the intestinal microfloral balance and benefit the host's overall health. They are combined with a nutrient called prebiotic to form a functional composition referred to as synbiotic.

Azodyl is a synbiotic that contains a patented mixture of three (3) bacteria (Kibow Biotics®) — *Enterococcus thermophilus*, *Lactobacillus acidophilus*, and *Bifidobacterium longum* — combined with a prebiotic, namely psyllium husk. **Azodyl's** bacteria are specifically screened and selected for their high affinity and capacity to metabolize uremic toxins.

Mode of action

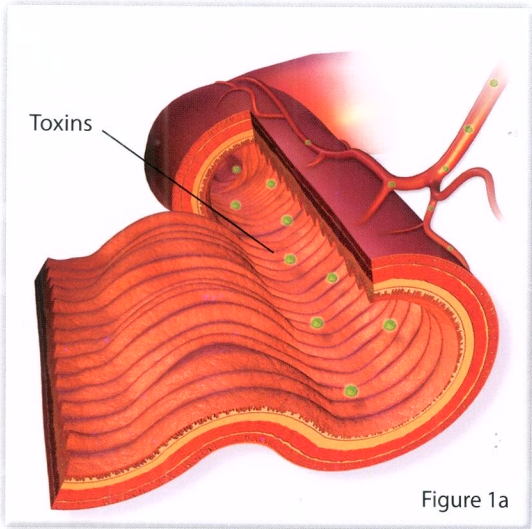


Figure 1a

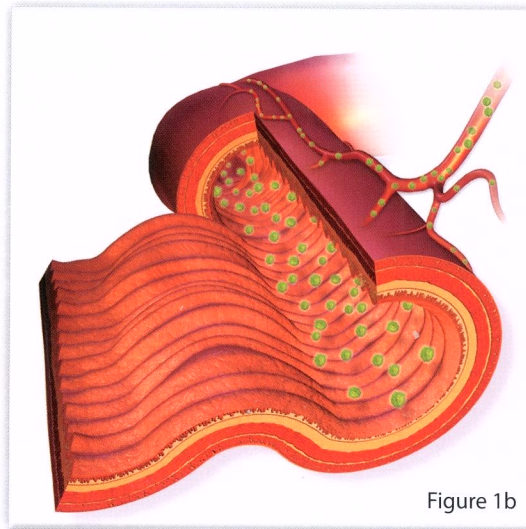


Figure 1b

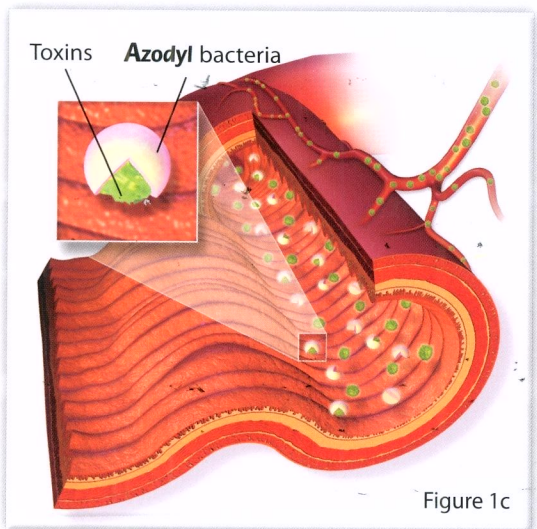


Figure 1c

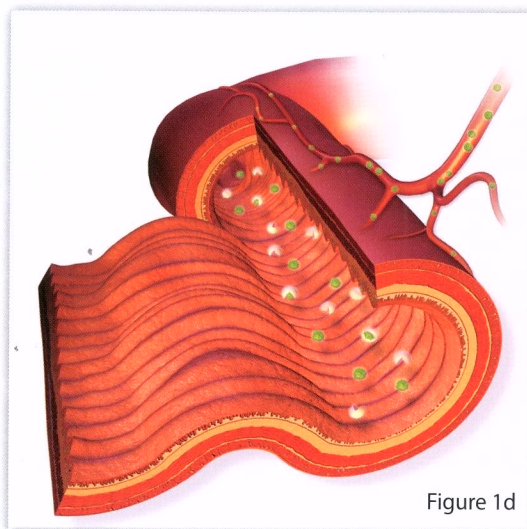
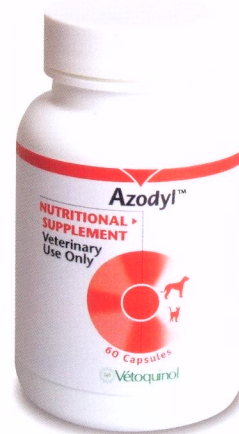


Figure 1d

- Even under normal healthy conditions, some amounts of uremic solutes flow into the large intestine by diffusion. (Figure 1a)
- In kidney failure, the toxic uremic solutes accumulate in the blood. They continue to diffuse into the large intestine, albeit in dramatically higher quantities. (Figure 1b)
- **Azodyl** metabolizes the diffused toxins maintaining the concentration gradient and continuing the process, effectively lowering uremic solutes in the blood. (Figures 1c and 1d)



Azodyl™
Renal Function Support
Through Enteric Dialysis®

Technical Profile

Studies on the efficacy of Azodyl

Study:

Azodyl reduces azotemia in minipigs ²

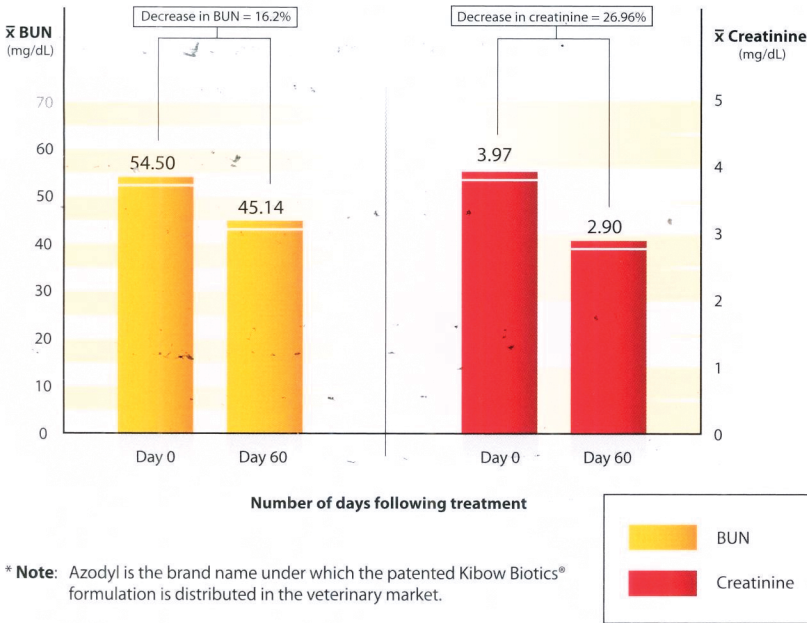
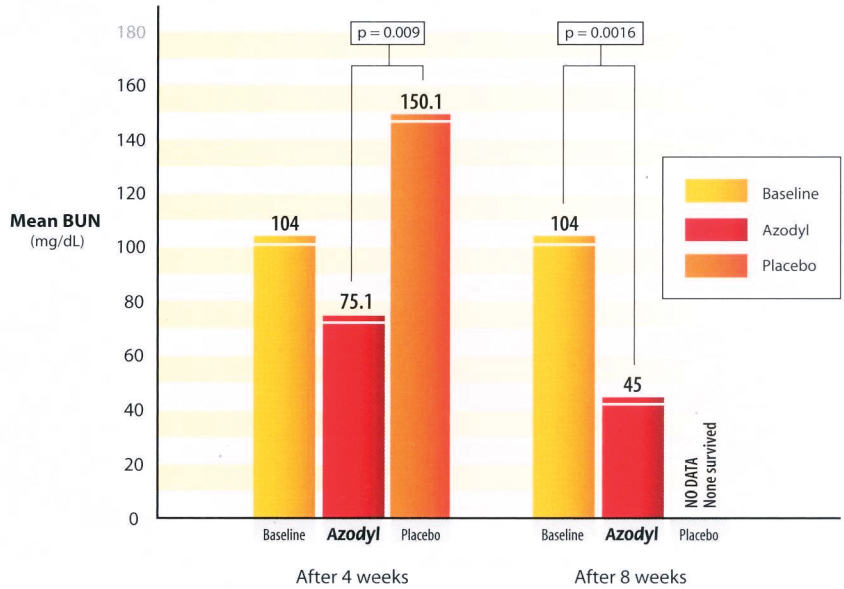
Protocol:

Two to four weeks post-nephrectomy, six 5/6th nephrectomized Gottingen minipigs with moderate BUN level (104±40.0 mg/dL) were assigned to two groups. Three subjects received Azodyl while the remaining three formed the placebo group.

Results:

The placebo group evinced a significant increase (p=0.009) in BUN after 2-4 weeks (150±0 mg/dL), when compared to the treatment group (75.1±37.9 mg/dL). All minipigs in the placebo group died within 4 weeks. Subjects in the Azodyl group showed a significant decrease (p=0.0016) in BUN levels from 104±40.0 to 45±5.0 mg/dL after 8 weeks, and all survived.

Conclusion: Azodyl fed as a daily treatment has the potential to decrease BUN levels and prolong survival in renal insufficiency. Study suggests further confirmation in larger trials.



* Note: Azodyl is the brand name under which the patented Kibow Biotics[®] formulation is distributed in the veterinary market.

Study:

A preliminary clinical evaluation of Azodyl[®] on feline azotemia ³

Protocol:

Seven cats presented to the author's clinic with elevated BUN (41 to 74 mg/dL) and serum creatinine (2.6 to 7.9 mg/dL) were enrolled in this uncontrolled trial. All cats received Azodyl for a period of 60 days. Body weight, blood chemistry results (BUN and creatinine) and general comments were collected before initiating the treatment, as well as at Day 30 and Day 60.

Results:

Results indicate a decrease in BUN in all cats and a reduction in creatinine levels in six out of seven (86%) patients treated with Azodyl, even though dosing was less than the recommended amount in most cats. Reductions in serum BUN and creatinine levels were also observed at Day 30.

Conclusion: Azodyl administered orally on a daily basis has the potential to decrease BUN and creatinine levels and has a place in the management of chronic kidney disease in cats.

Dosage and administration

Azodyl is an enteric-coated capsule and should not be split, in order to allow the live bacteria it contains to reach the large intestine, where the uremic solutes can be metabolized.

Storage: Since the product contains live cells, it should be refrigerated for best results.

Weight, lb	Morning dose	Evening dose
Less than 5 lb	1	0
5 - 10 lb	1	1
More than 10 lb	2	1

¹ Polzin, D.J. Chronic Kidney Disease. In: Ettinger, S.J., ed. Textbook of Veterinary Internal Medicine, Diseases of the Dog and Cat, 6th Edition St. Louis, MO: Elsevier Saunders; 2005, chapter 260.
² Ranganathan, N. et al. Probiotics reduce azotemia in Gottingen minipigs. Poster presentation at the 3rd World Congress of Nephrology, June 26-30, 2005, Singapore.
³ Palmquist, R. A preliminary clinical evaluation of Kibow Biotics[®], a probiotic agent, on feline azotemia. Journal of American Holistic Veterinary Medical Association, vol. 24, no. 4 (January-March 2006).

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