# Catalyst SDMA Test innovations improve workflow and decrease time to results

Symmetric dimethylarginine (SDMA) is a methylated form of arginine present in the intracellular proteins of nucleated cells in vertebrates. SDMA is excreted through the kidneys and correlates well with glomerular filtration rate (GFR) in people, dogs and cats.[1–4]

The IDEXX Catalyst* SDMA Test, which can be run on the Catalyst One* and Catalyst Dx* chemistry analysers, has been commercially available since 2017. As an indirect marker of GFR, it complements other biomarkers of kidney function such as creatinine and BUN. SDMA is a sensitive indicator of kidney function that detects on average a loss of 40% in function, often detecting damage that remains undetected by other parameters.[1–4] While creatinine typically does not exceed the reference cutoff until GFR is reduced by 75%.[1,4,5]

SDMA increases with both acute or active kidney injury and chronic kidney disease, allowing veterinarians to intervene earlier for more successful outcomes. Furthermore, SDMA, unlike creatinine, is often not impacted by lean body mass.[1,2,4,6,7] For these reasons, the Catalyst SDMA Test is an essential parameter on all routine chemistry profiles, allowing for a robust assessment of kidney function.

## The new Catalyst SDMA Test innovation

Innovations to the new Catalyst SDMA Test have improved workflow and decreased time to results, while continuing to provide exceptional performance. This new slide is stored along with current biochemistry slides in the freezer, can be run in any order with other Catalyst slides or CLIPs and no longer requires the reagent cup.

| Compatibility | Workflow |
|---|---|
| + Stored in the freezer with other Catalyst* slides<br>+ Optimised for Catalyst Dx and Catalyst One analysers | + Reagent cup removed<br>+ Run in any order with other Catalyst slides<br>+ Faster result times |

The new slide design is still compatible with serum and lithium heparin plasma from dogs or cats without the need for dilution. The new Catalyst SDMA Test will be available on both the Catalyst One and the Catalyst Dx chemistry analysers. It has the same reference interval (0–14 µg/dL), interpretive guidelines and reportable range (0–100 µg/dL) as the reference laboratory IDEXX SDMA* Test. The new Catalyst SDMA Test provides an accurate assessment of kidney function with improved workflow and efficiency.

The new Catalyst SDMA Test is the result of IDEXX's investment in innovation to improve workflow and practice efficiency, decrease plastic waste and optimise performance using best-in-class technology. The new Catalyst SDMA Test is a streamlined product developed with IDEXX SmartService in mind to allow for hands-free upgrades and management to ensure continued reliability.

## Description of study (methods)

The comparison of the new Catalyst SDMA Test with the gold-standard reference method liquid chromatography mass spectrometry (LC-MS) SDMA was conducted according to Clinical Laboratory Standards Institute (CLSI) guidelines.[8] A total of 192 serum or plasma samples were collected from 46 cats and 146 dogs for evaluation. All samples were collected at the discretion of the veterinarian for diagnostic purposes. Samples were analysed on the new Catalyst SDMA Test slide within hours of sample collection, either on the Catalyst Dx analyser (73 samples) or the Catalyst One analyser (119 samples), and the samples were shipped to IDEXX R&D (Westbrook, Maine) and frozen at -80°C until analysis by LC-MS within 90 days. LC-MS samples were measured in duplicate and reported as the mean result. Only fresh samples were used for the new Catalyst SDMA Test, as stored and frozen samples are not appropriate for the Catalyst SDMA Test. Outliers were screened using the Tukey fences method; no outliers were detected.

Precision was assessed using recombinant SDMA-spiked samples with concentrations of 13–15 µg/dL and 55–60 µg/dL. Samples were analysed 6 times per day over 5 days on instruments (12 Catalyst One and 12 Catalyst Dx analysers).

The potential for interference from haemolysis, lipaemia and icterus was evaluated in spiked canine plasma with SDMA concentrations of 10–15 µg/dL, 25–30 µg/dL and 55–60 µg/dL. Spiked samples were used to mimic 5 interferent concentrations ranging from 0–500 mg/dL for haemolysis and lipaemia, and 0–40 mg/dL for icterus.

## Results and discussion

### Method comparison of the Catalyst SDMA Test and LC-MS SDMA

SDMA values from the new Catalyst* SDMA Test were strongly correlated with SDMA values from the gold standard, LC-MS SDMA (figure 1).[1,4] Only fresh clinical serum samples were analysed with the new Catalyst SDMA Test as this technology is optimised for fresh, unrefrigerated samples run preferably within 2 hours of blood draw. The use of stored or frozen samples might impact clinical interpretation and would be inappropriate for performance evaluation. None of the clinical samples had SDMA concentrations at the upper extreme of the analytical range, but the samples are distributed across the clinically relevant range. Therefore, the regression plot provides valuable information about the expected performance on clinical samples.

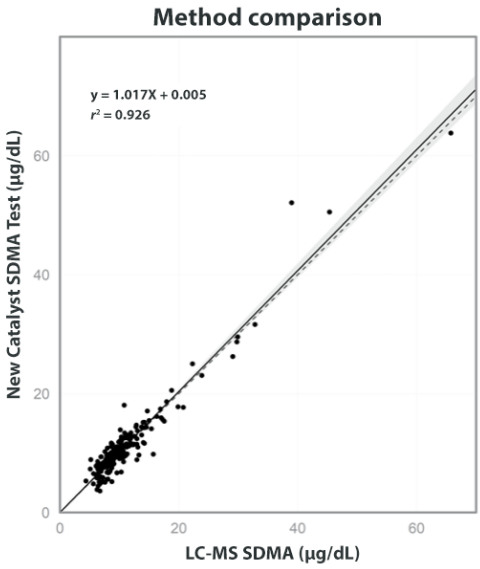


**Figure 1:** Scatter plot with least squares best fit line showing relationship of results from the new Catalyst SDMA Test to results from the gold-standard LC-MS SDMA. Results for 192 canine and feline samples are shown.

### Precision

The precision determined for the new Catalyst SDMA Test across both the Catalyst One* and Catalyst Dx* analysers and different days (table 1) is consistent with the previously reported precision for the reference laboratory IDEXX SDMA Test and LC-MS SDMA.

| Replicates | Mean concentration (µg/dL) | Standard deviation (µg/dL) | CV% |
|---|---|---|---|
| 720 | 16.12 | 1.49 | 9.27 |
| 720 | 60.93 | 2.37 | 3.89 |

**Table 1:** Summary of precision analysis for the new Catalyst SDMA Test across 12 Catalyst One and 12 Catalyst Dx analysers and 5 days at one concentration close to the reference interval and one at the upper end of the detectable range.

No clinically significant interference was seen with any level of haemolysis, lipaemia or icterus at any of the tested SDMA concentrations.

## Clinical use and benefit of the new Catalyst SDMA Test in real-time care

As a component of the chemistry panel, SDMA adds substantial value for both the sick and well patient in the early detection of primary kidney diseases and secondary functional decline due to concurrent disease. As SDMA is a sensitive and reliable early indicator of GFR impairment, its increase will often be the first indication of decline in kidney function.[1–4,10] These key features of SDMA allow for diagnosis and early management of otherwise undetectable kidney disease and can contribute to the recognition of undiagnosed concurrent diseases.

The use of SDMA in real-time care settings is especially informative for preanaesthetic and sick patient assessments. A single increase in SDMA can be a medical turning point and the first indication of decline in GFR and kidney disease.[10,11] The robust assessment of kidney function can allow for earlier intervention, confirm appropriate treatment choices, strengthen client communications and inform recheck and monitoring schedules that are most appropriate for the patient.

The new Catalyst* SDMA Test is stored in the freezer with current Catalyst* chemistry slides and is run with other Catalyst chemistry slides in any slide order. By eliminating the reagent cup and moving the reagent onto the slide, workflow and efficiency have been improved. Improved workflow means that results can be available faster, giving back time to veterinary staff and increasing in-clinic proficiency and timely decision-making.

In conclusion, the new Catalyst SDMA Test maintains excellent performance and provides real-time results to support the veterinarian, patient and client with the most complete set of clinical information for evaluating and managing kidney health.

## References


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