



## Pure Form of MSM

A demanding market for premium quality ingredients in the animal nutrition market supports a branded ingredient strategy. Now more than ever consumers are questioning the safety of the products they provide their animals. By using PurforMSM, made in the U.S.A., pet owners can be assured they are using the highest quality MSM available!

Methylsulfonylmethane (MSM) is created naturally through the earth's sulfur cycle when phytoplankton and algae die and decompose, releasing sulfur compounds into the atmosphere where they are transformed to DMS. In the presence of ozone and sunlight, DMS is converted to DMSO and MSM. Both are water-soluble and return to the earth's surface in rain water and are absorbed by vegetation and ultimately eaten by animals. These sources contain very small amounts of MSM, typically < 1 ppm, with the highest concentration in mammal's milk at 8.2 ppm. Therefore, all commercially available MSM must be manufactured because the amounts found naturally are too small to be extracted.

## The Healthful Benefits of PurforMSM®

PurforMSM is a naturally-occurring organic sulfur source, displaying a variety of health-promoting benefits.

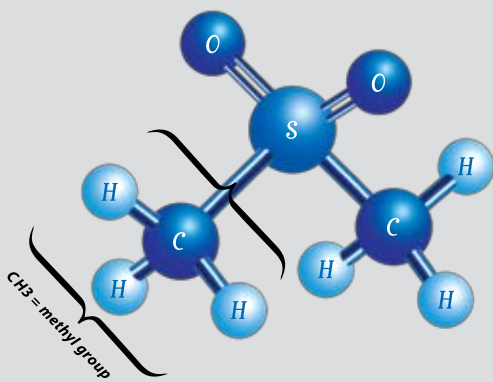
**Joint Health** – Several pre-clinical and clinical studies support the efficacy of MSM in supporting joint health and range of motion. Research shows that MSM down-regulates inflammatory markers that damage cartilage and protects its integrity.

**Respiratory Health** – MSM has shown to improve upper and lower respiratory symptoms due to seasonal allergies.

**Nail Health** – MSM is a rich source of sulfur; a key constituent for healthy nails.



MSM is 34.06% elemental sulfur, 25.52% carbon, 6.42% hydrogen and 34% oxygen.



## Dosage Range

PurforMSM® has exceptionally low toxicity and can be taken daily over a long period of time to help maintain good health. For specific applications please contact your Trow Nutrition representative.

### PurforMSM® Typical Inclusion Rate

Typical Inclusion Rate	mg/kg diet	lbs/ 2000 lbs
Puppy	2,000	4
Adult	2,500	5
Senior	3,000	6
Sporting/Active Lifestyles	4,000	8
Special Needs	5,000	10

\* Inclusion rates for extruded petfood premix.



## PurforMSM<sup>®</sup> Specification

Item #	13808652	13881352
Appearance	White Flake	White Powder
Volatile Purity	>99.8%	>99.8%
Melt Point	109.5°C ± 1.0°C	109.5°C ± 1.0°C
Water Content	<0.1%	<0.1%
DMSO Content	<0.05%	<0.05%
U.S. Sieve	Designation 12 NLT 98% through	Designation 40 NLT 95% through
Bulk Density	NLT 0.59 g/ml	NLT 0.75 g/ml
Tap Density	NLT 0.75 g/ml	NLT 0.79 g/ml
Expiration	5 years from production date	

### PurforMSM<sup>®</sup>

Is made in the U.S.A. to strict production specifications. Consistency is guaranteed by process control, monitored at every stage of production, followed by extensive analyticals.



## Rigorous Analyticals Verify Consistent Identity and Purity

### Volatile Purity by HRGC

> 99.8%

This is a highly specific quantitative method for determining the volatile purity of MSM. This method was developed with the process of manufacturing MSM in mind. It is more specific than HPLC (High Performance Liquid Chromatography).

### Melting Point

109.5°C ± 1.0°C

Extremely pure compounds have a distinct melt point. Non-volatile impurities will cause a non-distinct melt point that may be higher or lower than the acceptable value. Liquid will form when performing a melt point of impure product, but some solid material will remain at the melt point temperature, producing a larger range.

### Water Content

< 0.1%

Water content by Karl Fischer Titration is preferred for MSM. Other methods such as loss on drying and using a moisture balance can give erroneous results, as some of the MSM may be driven off by the heat, giving higher results than actual.

### DMSO Content

< 0.05%

Freedom from residual DMSO is verified by the HRGC method used for volatile purity. The HRGC method was developed with this in mind. When performing this test a "spiked" sample is also run to verify that DMSO would be detected by the instrument.





## Purification Method

Crystallization and distillation are the two methods that are used to purify MSM. Distillation is recognized by chemical engineers and other experts as the superior method. Members of the Bergstrom Nutrition staff pioneered the distillation process. MSM purified by distillation uses heat to separate impurities and by-products of manufacturing based on their unique boiling points. MSM's boiling point of 478° F (248° C) allows pure MSM to be isolated from solution. In distillation, purity is not dependent on the quality of water or raw material. In addition to being a very pure product, distilled MSM has a low moisture content, which reduces the risk of microbial contamination and product degradation.

In contrast, MSM purified by crystallization uses a wash and centrifuge process to separate impurities and by-products introduced during manufacturing. As crystals form, occlusions develop that can entrap contaminants present in the solution. The purity of the crystals depends on the quality of the water and the raw materials used in manufacturing.

## Commitment to Quality

Consistent quality and purity is our goal. That's why PurforMSM® is produced in the only single-purpose MSM production facility in North America that's certified compliant with Good Manufacturing Practices (GMP). No pesticides or herbicides are involved in the raw materials or the manufacturing process. There are no Genetically Modified Organisms (GMOs) used in this product, nor is there exposure to common allergens or aflatoxins. Further, to ensure a purity level of 99.9%, we confirm every batch through an independent laboratory and report the findings on a detailed certificate of analysis.

## About Bergstrom Nutrition

The only dedicated NPA GMP-certified MSM production facility in the world, exceeding industry standards for optimal purity and product consistency. The Vancouver, Washington based company pioneered the use of MSM for human & animal consumption in 1989. Their proprietary brands of MSM can be found in leading joint health products in all major channels. [www.purformsm.com](http://www.purformsm.com)

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**PurforMSM® is exclusively distributed through  
Trouw Nutrition USA.**

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## PurforMSM®

### Impurities Removed by 4 Stage Distillation

- Benzene
- Phenol
- Arsenic
- Lead
- Heptane
- Mercury
- Cadmium

### Pure Distilled PurforMSM

