ADISSEO
A Bluestar Company



RumenSmart™

USERS' GUIDE

Building a Better Future
for Animal Nutrition

Version 1 | 2023

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RumenSmart™ Users' Guide



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INTRODUCTION

RumenSmart™ is Adisseo's specific formulation containing DL-2-hydroxy-4 (methylthio) butanoic acid, an analogue of DL-methionine and its calcium salt, used in the production of animal feed for ruminants.

This guide contains technical information, storage and handling procedures, and application and inclusion guidelines for using RumenSmart™ in modern premix facilities and feed plants.

It is designed as a practical tool to help manufacturers everywhere produce top-quality feeds enriched with RumenSmart™ that will reach the feed bunk with maximum nutritional value.

The recommended techniques are based on accurate physical and chemical results, gathered from tests carried out both within Adisseo experimental facilities and under a wide range of field conditions. These techniques provide state-of-the-art recommendations for the use of RumenSmart™ throughout the production process.

For further details on procedures, equipment and safety measures, please contact your local Adisseo representative.

IMPORTANT CONTACT INFORMATION FOR WORLDWIDE USE

CareChem24 International (Emergency/HAZMAT Services):

See the Material Safety Data Sheet (MSDS) for your country

1/ PRODUCT TECHNICAL INFORMATION

PRODUCT DESCRIPTION:

RumenSmart™ is a beige-to-light-brown, granular powder. Its chemical formula is:

$(CH_3\text{-}S\text{-}CH_2\text{-}CH_2\text{-}CH(OH)\text{-}COO)_2Ca$, with CAS Nbr (4857-44-7)

The RumenSmart™ content in the hydroxy analogue of methionine is 84% minimum. This is guaranteed for 5 years from date of the manufacture, when kept in its original unopened packaging and stored well closed in a cool dry place.

MAIN PHYSICAL AND CHEMICAL PROPERTIES:

(Given for guidance, not a guarantee)

Calcium content:	min. 11.7%
Particle size, D50:	310 +/- 35 µm
Particle size > 1000 µm:	max 2%
Particle size < 100 µm:	max 4%
Apparent density:	0.4 to 0.6 g/cm^3
pH (in 5% aqueous solution):	4.0



RumenSmart™ granules

2/ STORAGE AND HANDLING

RumenSmart™ is not a dangerous product and does not require particular conditions for its storage or handling. Nevertheless, as for all additives used in a feed plant, we recommend the following.



- Use personal protective equipment that is clean and has been properly maintained.
- Store personal protective equipment in a clean place, away from the work area.
- Never eat, drink or smoke during use. Remove and wash contaminated clothing before re-using.
- Ensure that there is adequate ventilation, especially in confined areas.

PACKAGING:

RumenSmart™ is available in 22.5 kg bags and 800 kg big bags.



BULK STORAGE:

RumenSmart™ is a naturally fluid product. Its Flodex index is <4mm (diameter of the hole through which the product flows freely), which is good. In addition, the compressibility (tapped density/apparent density ratio) is 3.6%, which is low. Therefore, the product does not have a natural tendency to compact, which is confirmed by field experience. Its moderate hygroscopicity, which translates into a mass gain of 1.3% over 8 days, should be a point of vigilance for locations or periods of high air humidity which may cause bridging.

3/ APPLICATION - INCLUSION IN FEEDS

3.1 FEED FORMULATION AND COMPOSITION

FEEDING RATES:

Typical feeding rates range between 25 and 40g/cow/day, according to ration composition, dry matter intake, stage of lactation, etc. Consult your nutritionist to determine the adequate feeding rate in your case.

FEED TYPES:

RumenSmart™ can be included in all of the following feeds:

- Premixes
- Base mixes or mineral mixes
- Blends, dilutions, protein supplements
- Compound feeds, complementary feeds, complete feeds
- Pelleted feeds
- Etc.

COMPATIBILITIES:

RumenSmart™ mixes well with most feedstuffs and has few known incompatibilities, after several years of widespread use. However, a few situations have been identified as potentially being a problem.

- **RumenSmart™ should not be added to a liquid feed or diluted in water.** It is not designed for this and will agglomerate if you do so.

Example: 5% RumenSmart™ in water ▶



- **RumenSmart™ and MetaSmart® can interact when placed in the same feed, particularly at high concentrations, leading to caking.**

  » RumenSmart™ and MetaSmart® separately can each be safely mixed with ground corn or wheatfeed and limestone, for example. However, when both were combined in one feed, a strong caking reaction occurred within one week of mixing.

  » This was shown with inclusion rates from 32 & 20% MetaSmart® Dry & RumenSmart™ respectively, down to 8 & 5%. With inclusion rates of 4 & 2.5%, caking no longer occurred, but a suspicion of a beginning of a reaction was noted.

  » This caking seems to be due to the calcium carbonate in RumenSmart™ reacting with the silica in MetaSmart® in the presence of some humidity.

  » Thus, our current recommendation is to not combine these two products in the same feed, as a precautionary measure. Again, they can be included individually in separate feeds with no physical or chemical concern.

  » Further studies or tests at lower inclusion rates might determine at what concentration rates below 4 & 2.5% these products can be combined in one feed without concern. The lower the concentration rates, the lower the statistical chances of MetaSmart® particles being in contact with RumenSmart™ particles.



Example 1: Formulation containing 60% MetaSmart® Dry and 37% RumenSmart™ (photos taken after caking was broken)



Example 2: Formulation containing 33% MetaSmart® and 13% RumenSmart™ (photos taken after bags were shaken)

RumenSmart™ has a relatively strong characteristic smell (close to a strong cabbage smell), due to its sulfur components. Palatability of the feed containing RumenSmart™ will therefore, depend on its inclusion rate and what other feedstuffs are included in the feed. In some cases, a flavor or aroma may be useful to enhance the feed's palatability.

For all other incorporation and processing steps, follow standard best practices for using feed additves

4/ STABILITY DURING STORAGE

- Store RumenSmart™ in a cool dry place.
- Same for feed including RumenSmart™.

5/ QUALITY ASSURANCE AND ANALYSES

- Adisseo can analyze your feeds for you to check their RumenSmart™ content, as part of your quality assurance program. Do not hesitate to contact your Adisseo representative for more information on this, including our E.lab service.

6/ MAIN SAFETY DATA

Hazard Identification:
Classified as a "hazardous preparation" related to GHS05:

Emergency showers and eye wash stations will be required in facilities where the mixture is handled constantly.

In use, may form flammable/explosive dust-air mixture.

By precaution, if material is pneumatically transferred a proven bonding and grounding system should be utilized.

Keep away from strong oxidizing agents and acids.



H318: causes serious eye damage.

PPE Recommended:





First aid measures:
As a general rule, in case of doubt or if symptoms persist, always call a doctor.

- Exposure by inhalation: If inhaled, move the patient into the fresh air and keep warm and at rest.
- Contact with eyes: wash thoroughly with soft, clean water for 15 minutes holding the eyelids open.
- Contact with skin: wash skin thoroughly with soap and water or a recognized cleaner.
- Swallowing: do not force vomiting. Seek medical attention, showing the label.

Packaging:
Always keep in packaging made of an identical material to the original.
Unsuitable packaging materials: aluminium.

Firefighting measures:
Non-flammable.
In the event of a fire, immediate and rapid evacuation is necessary.

Extinguishing media:

Suitable:
- sprayed water or water mist
- foam
- powder
- carbon dioxide (CO2)

Not Suitable:
- water jet

Special hazards arising from the substance or mixture:
Combustion may release toxic gases (carbon monoxide, carbon dioxide, sulphur dioxide).

Due to the toxicity of the gas emitted on thermal decomposition of the products, firefighting personnel are to be equipped with autonomous insulating breathing apparatus.

Accidental release measures:
Retrieve the product by mechanical means (sweeping/vacuuming): do not generate dust.

Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.

Environmental protection:
Do not pour into drains and waterways.

Soluble in water.

The substance is considered as not degrading quickly.

This preparation does not present any particular risk to the environment.

For further information, please refer to the **Material Safety Data Sheets** (MSDS).

European MSDS available in the website QuickFDS.

Please find in this link guidelines to consult them:

https://plm.adisseo.com/share/s/81qZVtlwTQS4GtFL9Usm5w

If needed:

CareChem 24: 24 hours international emergency (phone number available in MSDS).

CareChem 24 will provide rapid access to information about the hazards of RumenSmart™ in addition to expert advice on appropriate response actions to protect your employees, the public and the environment.

7/ EMERGENCY CONTACT INFORMATION

CareChem24 International (Emergency/HAZMAT Services):

See the Material Safety Data Sheet (MSDS) for your country

NOTES:

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RumenSmart™

USERS' GUIDE

ADISSEO HEADQUARTERS
ADISSEO EUROPE - CIS
ADISSEO France S.A.S
Immeuble Antony Parc 2
10, Place du Général de Gaulle
92160 Antony - FRANCE

NORTH AMERICA
ADISSEO USA Inc
4501 North Point Pkwy, Suite 200
30022 ALPHARETTA, GA - US

ADISSEO INDIA SUB CONTINENT
Animal Nutrition Private Limited
Unit N° t-3135th
Avenue Brigade road56001
Bangalore - INDIA

LATIN AMERICA
ADISSEO Brasil Nutrição Animal Ltda.
Avenida Maria Coelho Aguiar, 215
Bloco G - 1° andar
Jardim São Luis – São Paulo -SP - BRAZIL

ASIA PACIFIC
ADISSEO Asia Pacific Pte Ltd
600 North Bridge Road,
#15-06 to 08 Parkview Square
Singapore 188 778 - SINGAPORE

CHINA
ADISSEO Life Science
Suite 1003-1006, Kerry Parkside
1155 Fangdian Rd., Pudong New Area
Shanghai 201204 - CHINA (PRC)

MIDDLE-EAST & AFRICA
ADISSEO Animal Nutrition DMCC
Office No. 2002 & 2003, Tiffany Tower,
Cluster W,
JLT, Dubai, UAE

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A Bluestar Company