1. NAME OF THE VETERINARY MEDICINAL PRODUCT

MULTIMIN Solution for Injection for Cattle (AT, BE, BG, EL, ES, FR, HU, IE, LT, LU, NL, NO, PL, PT, RO, SI, SK, UK(NI))
MULTIMIN Vet (FI, DK & SE)
MULTIMIN, Solution for Injection for Cattle (EE, LV, IT & HR)

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains:

Active substances:
Zinc: 60 mg (equivalent to zinc oxide 74.68 mg)
Manganese: 10 mg (equivalent to manganese carbonate 20.92 mg)
Copper: 15 mg (equivalent to copper carbonate 26.09 mg)
Selenium: 5 mg (equivalent to sodium selenite 10.95 mg)

Excipients:

Qualitative composition of excipients and other constituents	**Quantitative composition if that information is essential for proper administration of the veterinary medicinal product**
Benzyl alcohol (E1519)	10.4 mg
Edetic acid	
Sodium hydroxide	
Water for injection	

Clear blue solution.

3. CLINICAL INFORMATION

3.1 Target species

Cattle.

3.2 Indications for use for each target species

Supply of trace minerals to correct concurrent clinical or subclinical deficiencies of selenium, copper, manganese and zinc which can arise during critical phases of the production or breeding life cycle.

3.3 Contraindications

Do not administer intramuscularly.
Do not use in cases of hypersensitivity to the active substances or to any of the excipients.

3.4 Special warnings

None.

3.5 Special precautions for use

Special precautions for safe use in the target species:
Additional copper, zinc, manganese or selenium should not be administered at the same time.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
This veterinary medicinal product is HIGHLY concentrated in Selenium.
Due to a potential risk of Selenium toxicity, care should be taken when handling the veterinary medicinal product to avoid accidental self-injection.
The most common manifestations of accidental exposure to selenium in humans are gastrointestinal and neurological symptoms, such as nausea, vomiting, tenderness, fatigue and irritability.
When treating a large number of animals, a safe injection system should be used.
Do not work alone when using the veterinary medicinal product.
Ensure that animals are properly restrained, including those in the vicinity.
In case of accidental self-injection, SEEK MEDICAL ADVICE IMMEDIATELY and show the package leaflet or the label to the physician.
Wash hands after use.

Special precautions for the protection of the environment:
Not applicable.

3.6 Adverse events

Cattle:

Very common (>1 animal / 10 animals treated):	Injection site swelling[1] Injection site induration[2]
Common (1 to 10 animals / 100 animals treated):	Injection site pain[3]

[1] Moderate to severe that can persist for approximately 7 days following injection.
[2] Estimated at less than 5 cm at palpation after 14 days following injection.
[3] Mild. Immediate upon injection. Can persist for up to eight hours after injection.

Reporting adverse events is important. It allows continuous safety monitoring of a veterinary medicinal product. Reports should be sent, preferably via a veterinarian, to either the marketing authorisation holder or its local representative or the national competent authority via the national reporting system. See the package leaflet for respective contact details.

3.7 Use during pregnancy, lactation or lay

Pregnancy and lactation:
Can be used during pregnancy and lactation.

3.8 Interaction with other medicinal products and other forms of interaction

None known.

3.9 Administration routes and dosage

Strictly for subcutaneous use only.
To ensure a correct dosage, body weight should be determined as accurately as possible.
Use standard aseptic procedures during administration of injections.
Strict adherence to correct subcutaneous injection technique should be employed.

Dosage:
Cattle - Up to 1 year: 1 ml per 50 kg
Cattle - From 1-2 years: 1 ml per 75 kg

Cattle - Over 2 years: 1 ml per 100 kg

Schedule of administration:
To be administered as a single administration during, or in advance of, periods of stress in the production and breeding life cycle likely to result in concurrent clinical or subclinical deficiencies of the four trace minerals (for example, transport/shipping, calving, breeding).

Maximal volume per injection site: 7 ml.

The 500 ml vial can be broached a maximum of 90 times.

3.10 Symptoms of overdose (and where applicable, emergency procedures and antidotes)

No systemic adverse reactions were observed after repeated overdosing (3 consecutive daily administrations) at one to three times the recommended dose (i.e. 3x-9x recommended dose).

In one study, repeated overdosing (3 consecutive daily administrations) at 5.6x the recommended dose (i.e., 16.7x recommended dose) is associated with elevation of liver enzymes and hepatic centrilobular necrosis in six animals out of eight, with mortality in one animal.

3.11 Special restrictions for use and special conditions for use, including restrictions on the use of antimicrobial and antiparasitic veterinary medicinal products in order to limit the risk of development of resistance

Not applicable.

3.12 Withdrawal periods

Meat and offal: 28 days.
Milk: zero hours.

4. PHARMACOLOGICAL INFORMATION

4.1 ATCvet code: QA12CX99

4.2 Pharmacodynamics

Manganese is indispensable for the action of glycotransferase. This enzyme plays a role in the formation of the mucopolysaccharide chondroitin sulphate, which is a component of cartilage and due to its action on the formation of cartilage, it is also important for bone formation. Mn is an important component of Mn superoxide dismutase enzyme used in the enzymatic antioxidant system. Although manganese is also part of pyruvic carboxylase and several other enzymes, other divalent cations may serve as alternatives for its role in the activity of these enzymes.

Copper forms an integral part of a number of metalloproteins notably caeruloplasmin, monoamine oxidase, lysyl oxidase, cytochrome C and superoxide dismutase enzymes.

Zinc acts as a cofactor of numerous enzymes, e.g. alcohol dehydrogenase, carbonic anhydrase and carboxypeptidase. Zn is an important component of Zn superoxide dismutase enzyme used in the enzymatic antioxidant system. Zinc plays a role in protein synthesis and cell division. It also exerts crucial influence on the maintenance of cell membrane stability and in the function of the immune system. The connection between the known physiological functions of zinc and the various manifestations of zinc deficiency remain largely unexplained. Zinc interacts with several metabolic ions. Copper, calcium and phytate (a constituent of cereals) reduce zinc absorption; cadmium and zinc compete with each other.

Selenium exerts an antioxidative effect at the cell membrane against hydrogen peroxide and lipoperoxides. The effects are related to enzymatic activity of glutathione peroxidase (GSHPx) which contains selenocysteine. Selenium's protective antioxidative action is partially linked to that of vitamin E. Selenocysteine is also an integral component of other functional proteins e.g. tetra-idothyronine-5-I-deiodinase (involved in metabolism of thyroid hormones) but the full extent of the biochemical mode of action of selenium in the body still remains to be elucidated.

4.3 Pharmacokinetics

Absorption:

- Following subcutaneous administration, the trace minerals are rapidly absorbed from the injection site.

Distribution:

- Once absorbed, manganese is transported to organs rich in mitochondria (in particular the liver, pancreas, and pituitary) where it is rapidly concentrated. The main organ involved in manganese accumulation is the liver which accumulates significantly higher levels of manganese statistically than the kidney. The turnover of manganese in mammalian tissues is rapid.
- Absorbed copper binds to plasma albumin and amino acids in the portal blood and is transported to the liver where it is incorporated into caeruloplasmin and later released into the plasma. Hepatic copper is distributed in several subcellular fractions associated with copper-dependent enzymes and copper-dependent proteins. Copper is also found in erythrocytes in the form of erythrocuprein and other proteins and in bone marrow bound to metallothionein.
- Zinc accumulation is most striking in muscle, followed by the liver, kidney and blood. Zinc values in muscle, liver and kidneys are similar.
- Parenteral selenium is initially transported by serum albumin, after absorption, and later by alpha-2 and beta-1globulin fractions. Selenium is distributed throughout the body, but the highest amounts are present in the liver, kidneys, and muscle.

Metabolism:

- Manganese does not metabolize; it is absorbed and excreted unchanged.
- Copper is available for metabolism by the liver when present as the form bound to albumin. The liver is the major storage organ for copper where it is protein bound, followed by the kidney, muscle and blood.
- After absorption into the body, zinc becomes bound to protein complexes, the most important of which is metallothionein, which acts as a carrier and transport mechanism. As an element zinc is not metabolized per se. Zinc does not accumulate in the body following continued [excessive] exposure.
- The metabolic process involving selenium is dependent on the chemical form and dose as well as on nutritional status. Major metabolites are methylated selenites. Two major metabolic products of selenite have been identified: dimethyl selenide and a trimethylselenonium ion.

Excretion:

- The liver, pancreas, adrenals and intestine play a role in the predominantly faecal excretion of manganese. Small amounts may be excreted in urine. For calves, 21% of an injected dose of manganese is excreted in bile.
- Excess copper is excreted mainly via bile and faeces, though urinary losses account for 0.5% to 3% of the daily intake.
- Excretion of absorbed zinc takes place mainly via bile (80%) and less so via urine and sweat.

5. PHARMACEUTICAL PARTICULARS

5.1 Major incompatibilities

In the absence of compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

5.2 Shelf life

Shelf life of the veterinary medicinal product as packaged for sale: 30 months.
Shelf life after first opening the immediate packaging: 28 days.

5.3 Special precautions for storage

This veterinary medicinal product does not require any special storage conditions.

5.4 Nature and composition of immediate packaging

Primary packaging: Clear Polyethylene Terephthalate (PET) vial closed with grey bromobutyl rubber stopper sealed with aluminium cap.

Package sizes:
Cardboard box containing one vial of 100 ml.
Cardboard box containing one vial of 500 ml.

Not all pack sizes may be marketed.

5.5 Special precautions for the disposal of unused veterinary medicinal products or waste materials derived from the use of such products

Medicines should not be disposed of via wastewater or household waste.

Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any national collection systems applicable to the veterinary medicinal product concerned.

6. NAME OF THE MARKETING AUTHORISATION HOLDER

Warburton Technology Limited

7. MARKETING AUTHORISATION NUMBER(S)

8. DATE OF FIRST AUTHORISATION

Date of first authorisation: {DD/MM/YYYY}

9. DATE OF THE LAST REVISION OF THE SUMMARY OF THE PRODUCT CHARACTERISTICS

{MM/YYYY}
{DD/MM/YYYY}
{DD month YYYY}

10. CLASSIFICATION OF VETERINARY MEDICINAL PRODUCTS

Veterinary medicinal product subject to prescription.

Detailed information on this veterinary medicinal product is available in the Union Product Database (https://medicines.health.europa.eu/veterinary).

ANNEX III

LABELLING AND PACKAGE LEAFLET

A. LABELLING

PARTICULARS TO APPEAR ON THE OUTER PACKAGE

Box containing a vial of 100 ml or 500 ml

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

MULTIMIN Solution for Injection for Cattle

2. STATEMENT OF ACTIVE SUBSTANCES

Each ml contains:
Zinc: 60 mg (equivalent to zinc oxide 74.68 mg)
Manganese: 10 mg (equivalent to manganese carbonate 20.92 mg)
Copper: 15 mg (equivalent to copper carbonate 26.09 mg)
Selenium: 5 mg (equivalent to sodium selenite 10.95 mg)

3. PACKAGE SIZE

100 ml
500 ml

4. TARGET SPECIES

5. INDICATIONS

6. ROUTES OF ADMINISTRATION

Strictly for subcutaneous use only. Do not administer intramuscularly.

Dosage:
Cattle - Up to 1 year: 1 ml per 50 kg
Cattle - From 1-2 years: 1 ml per 75 kg
Cattle - Over 2 years: 1 ml per 100 kg

Maximal volume per injection site: 7 ml.

7. WITHDRAWAL PERIODS

Withdrawal periods:
Meat and offal: 28 days.
Milk: zero hours.

8. EXPIRY DATE

Exp. {mm/yyyy}
Once broached, use within 28 days. Use by:…

9. SPECIAL STORAGE PRECAUTIONS

10. THE WORDS "READ THE PACKAGE LEAFLET BEFORE USE"

Read the package leaflet before use.

11. THE WORDS "FOR ANIMAL TREATMENT ONLY"

For animal treatment only.

12. THE WORDS "KEEP OUT OF THE SIGHT AND REACH OF CHILDREN"

Keep out of the sight and reach of children.

13. NAME OF THE MARKETING AUTHORISATION HOLDER

Warburton Technology Limited

14. MARKETING AUTHORISATION NUMBERS

15. BATCH NUMBER

Lot {number}

PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGE

Vial of 100 ml and 500 ml

1. NAME OF THE VETERINARY MEDICINAL PRODUCT

MULTIMIN Solution for Injection for Cattle

2. STATEMENT OF ACTIVE SUBSTANCES

Each ml contains:
Zinc: 60 mg (equivalent to zinc oxide 74.68 mg)
Manganese: 10 mg (equivalent to manganese carbonate 20.92 mg)
Copper: 15 mg (equivalent to copper carbonate 26.09 mg)
Selenium: 5 mg (equivalent to sodium selenite 10.95 mg)

3. TARGET SPECIES

4. ROUTES OF ADMINISTRATION

Strictly for subcutaneous use only. Do not administer intramuscularly.

Dosage:
Cattle - Up to 1 year: 1 ml per 50 kg
Cattle - From 1-2 years: 1 ml per 75 kg
Cattle - Over 2 years: 1 ml per 100 kg

Maximal volume per injection site: 7 ml.

Read the package leaflet before use.

5. WITHDRAWAL PERIODS

Withdrawal periods:
Meat and offal: 28 days.
Milk: zero hours.

6. EXPIRY DATE

Exp. {mm/yyyy}
Once broached, use within 28 days. Use by:…

7. SPECIAL STORAGE PRECAUTIONS

8. NAME OF THE MARKETING AUTHORISATION HOLDER

Warburton Technology Limited

9. BATCH NUMBER

Lot {number}

B. PACKAGE LEAFLET

PACKAGE LEAFLET

1. Name of the veterinary medicinal product

MULTIMIN Solution for Injection for Cattle (AT, BE, BG, EL, ES, FR, HU, IE, LT, LU, NL, NO, PL, PT, RO, SI, SK, UK(NI))
MULTIMIN Vet (FI, DK & SE)
MULTIMIN, Solution for Injection for Cattle (EE, LV, IT & HR)

2. Composition

Each ml contains:

Active substances:
Zinc: 60 mg (equivalent to zinc oxide 74.68 mg)
Manganese: 10 mg (equivalent to manganese carbonate 20.92 mg)
Copper: 15 mg (equivalent to copper carbonate 26.09 mg)
Selenium: 5 mg (equivalent to sodium selenite 10.95 mg)

Excipients:
Benzyl alcohol (E1519) 10.4 mg

Clear blue solution.

3. Target species

Cattle.

4. Indications for use

Supply of trace minerals to correct concurrent clinical or subclinical deficiencies of selenium, copper, manganese and zinc which can arise during critical phases of the production or breeding life cycle.

5. Contraindications

Do not administer intramuscularly.
Do not use in cases of hypersensitivity to the active substances or to any of the excipients.

6. Special warnings

Special warnings:
None.

Special precautions for safe use in the target species:
Additional copper, zinc, manganese or selenium should not be administered at the same time.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
This veterinary medicinal product is HIGHLY concentrated in Selenium.

Due to a potential risk of Selenium toxicity, care should be taken when handling the veterinary medicinal product to avoid accidental self-injection.
The most common manifestations of accidental exposure to selenium in humans are gastrointestinal and neurological symptoms, such as nausea, vomiting, tenderness, fatigue and irritability.
When treating a large number of animals, a safe injection system should be used.
Do not work alone when using the veterinary medicinal product.
Ensure that animals are properly restrained, including those in the vicinity.
In case of accidental self-injection, SEEK MEDICAL ADVICE IMMEDIATELY and show the package leaflet or the label to the physician.
Wash hands after use.

Pregnancy and lactation:
Can be used during pregnancy and lactation.

Interaction with other medicinal products and other forms of interaction:
None known.

Overdose:
No systemic adverse reactions were observed after repeated overdosing (3 consecutive daily administrations) at one to three times the recommended dose (i.e. 3x-9x recommended dose).

In one study, repeated overdosing (3 consecutive daily administrations) at 5.6x the recommended dose (i.e., 16.7x recommended dose) is associated with elevation of liver enzymes and hepatic centrilobular necrosis in six animals out of eight, with mortality in one animal.

Major incompatibilities:
In the absence of compatibility studies, this veterinary medicinal product must not be mixed with other veterinary medicinal products.

7. Adverse events

Cattle:

Very common (>1 animal / 10 animals treated):	Injection site swelling[1] Injection site induration[2]
Common (1 to 10 animals / 100 animals treated):	Injection site pain[3]

[1] Moderate to severe that can persist for approximately 7 days following injection.
[2] Estimated at less than 5 cm at palpation after 14 days following injection.
[3] Mild. Immediate upon injection. Can persist for up to eight hours after injection.

Reporting adverse events is important. It allows continuous safety monitoring of a product. If you notice any side effects, even those not already listed in this package leaflet, or you think that the medicine has not worked, please contact, in the first instance, your veterinarian. You can also report any adverse events to the marketing authorisation holder or its local representative using the contact details at the end of this leaflet, or via your national reporting system: {national system details}

8. Dosage for each species, routes and method of administration

Strictly for subcutaneous use only.

Dosage:
Cattle - Up to 1 year: 1 ml per 50 kg

Cattle - From 1-2 years: 1 ml per 75 kg
Cattle - Over 2 years: 1 ml per 100 kg

Schedule of administration:
To be administered as a single administration during, or in advance of, periods of stress in the production and breeding life cycle likely to result in concurrent clinical or subclinical deficiencies of the four trace minerals (for example, transport/shipping, calving, breeding).

Maximal volume per injection site: 7 ml.

9. Advice on correct administration

Use standard aseptic procedures during administration of injections.
Strict adherence to correct subcutaneous injection technique should be employed.
To ensure a correct dosage, body weight should be determined as accurately as possible.
The 500 ml vial can be broached a maximum of 90 times.

10. Withdrawal periods

Meat and offal: 28 days.
Milk: zero hours.

11. Special storage precautions

Keep out of the sight and reach of children.
This veterinary medicinal product does not require any special storage conditions.
Do not use this veterinary medicinal product after the expiry date which is stated on the label and the carton after Exp. The expiry date refers to the last day of that month.
When the container is broached (opened) for the first time, using the in-use shelf-life which is specified on this package leaflet, the date on which any veterinary medicinal product remaining in the carton should be discarded should be worked out. This discard date should be written in the space provided.
Shelf life after first opening the immediate packaging: 28 days.

12. Special precautions for disposal

Medicines should not be disposed of via wastewater or household waste.
Use take-back schemes for the disposal of any unused veterinary medicinal product or waste materials derived thereof in accordance with local requirements and with any applicable national collection systems. These measures should help to protect the environment.
Ask your veterinary surgeon or pharmacist how to dispose of medicines no longer required.

13. Classification of veterinary medicinal products

Veterinary medicinal product subject to prescription.

14. Marketing authorisation numbers and pack sizes

Package sizes:

Cardboard box containing one vial of 100 ml.
Cardboard box containing one vial of 500 ml.

Not all pack sizes may be marketed.

15. Date on which the package leaflet was last revised

{MM/YYYY}
{DD/MM/YYYY}
{DD month YYYY}

Detailed information on this veterinary medicinal product is available in the Union Product Database (https://medicines.health.europa.eu/veterinary).

16. Contact details

Marketing authorisation holder and contact details to report suspected adverse events:
Warburton Technology Limited
36 Fitzwilliam Square
Dublin 2
Ireland
Email: aereports@axiota.com
+1-877-907-5315

Manufacturer responsible for batch release:
Laboratoires Biové
Rue de Lorraine
B.P. 45
62510 Arques
France

Local representatives and contact details to report suspected adverse events:

For any information about this veterinary medicinal product, please contact the local representative of the marketing authorisation holder.

17. Other information