Perspectives for antibiotic replacement in semen diluents and the NeoGiANT approach

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NeoGiANT, WP6 “Assessment of antimicrobial formulation for sperm preservation”

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Why are antibiotics a problem in animal reproduction?

Assissted reproductive tecnologies (ART) are widespread in modern animal breeding

Artificial insemination (AI) is a leading technology

>90%

sows, dairy cows and turkeys are inseminated in EU and USA, growing elsewhere.

BUT

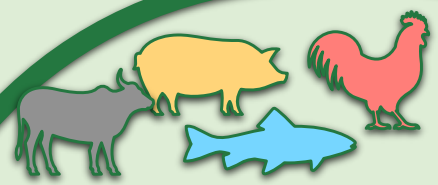
Semen diluents contain antibiotics

Continuous leak of broad-spectrum antibiotics to the environment.

Only the pig industry uses

8 000 000 L

of antibiotic-containing semen extenders per year in the EU

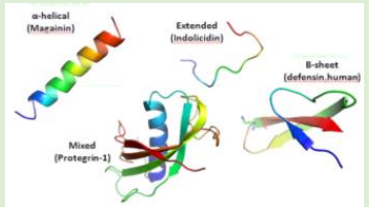
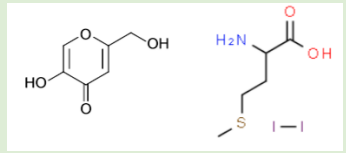


NeoGiANT

Antimicrobial natural extracts from grape marc for replacing antibiotics in animal production.

WP6 - Assessment of the antimicrobial formulation for sperm for preservation

What can be done for substituting antibiotics in semen diluents?

	Physical methods	Antimicrobial peptides	Non-peptidic antimicrobial molecules	Natural extracts
				
How	Remove bacteria by low-density colloid	Immune defense, disrupt bacterial membranes	Bacterial toxicity	Plant sources, many antimicrobial molecules
Strengths	Bacteria removed, no antibiotics	Effective and few AMR	Inhibit bacterial growth at concentrations not detrimental for sperm	Natural sources, sustainable, low cytotoxicity and AMR risk, antioxidants
Weaknesses	Impractical, cost	Detrimental on spem (membrane similarity), AMR risk	Preliminary, no fertility data	Preliminary, no fertility data

What can be done for substituting antibiotics in semen diluents?

Natural extracts

NeoGiANT

bioactive extracts sustainably obtained from grape marc

- Low cytotoxicity
- High antimicrobial potential

WP6 - Assessment of the antimicrobial formulation for sperm for preservation

Currently testing

- Formulation compatibility

- Safety for spermatozoa

Conclusions and implications

Removing antibiotics from reproductive techniques would prevent continuous release of these substances and resistant microorganisms to the environment, contributing to reduce AMR.

NeoGiANT combines a sustainable, circular economy extraction method with a low-toxicity product potentially suitable for semen diluents.