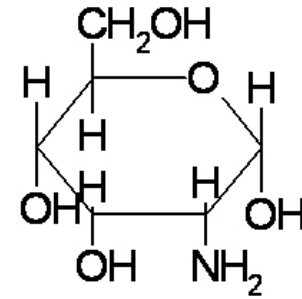
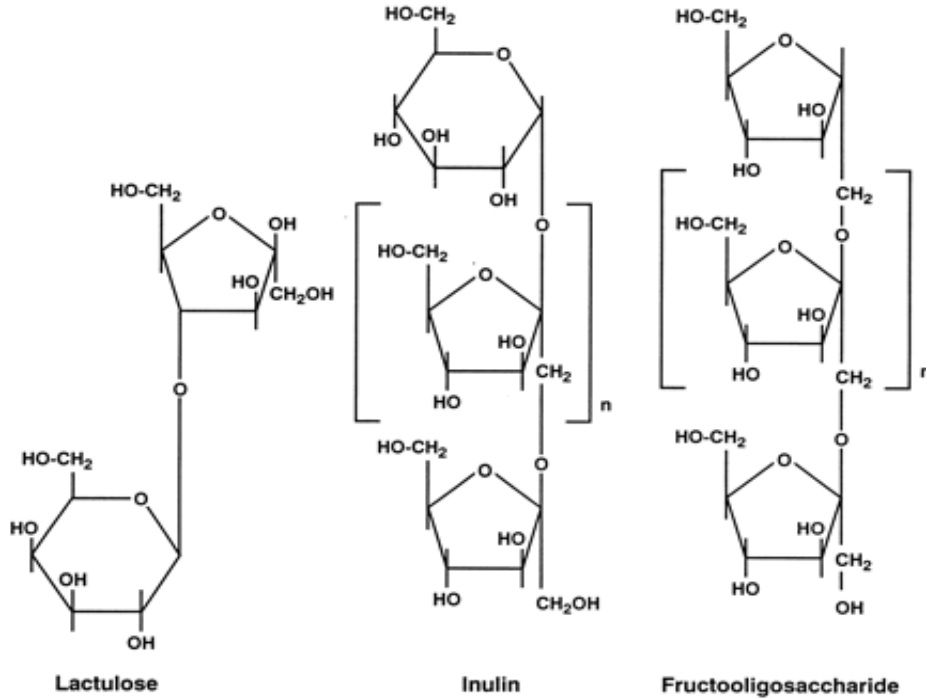


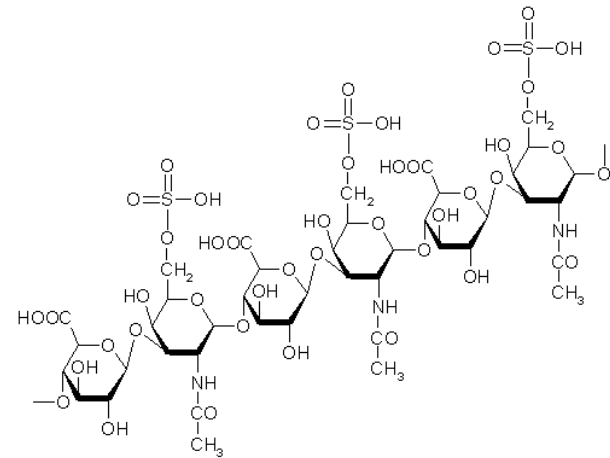
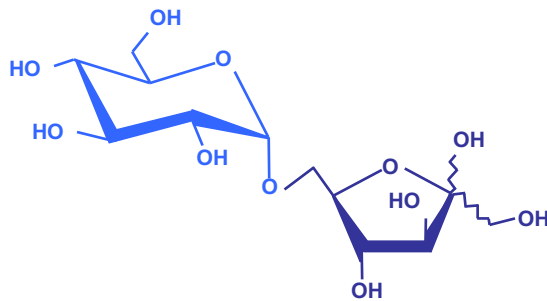
Adequate use of complex sugar in horses

Dr Briec de Moffarts
R&D Manager
PAVESCO-TWYDIL

Complex Sugar



Molecular Structure of Glucosamine



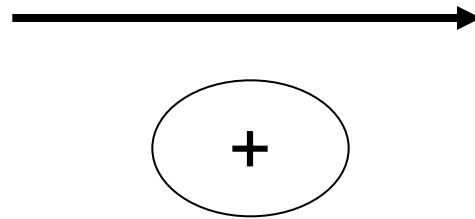
A) Prebiotics

Definition:

- Non digestible feeds
- Fermentescible
- . Beneficial for health or well-being
- Specifically stimulate the microflora growth or activity

A) Prebiotics

- Lactulose
- MdOS
- FOS
- TOS
- MOS
- ...



Microflora
pH
VFA

In balance ecosystem

A) Prebiotics

Lactate producing

Lactobacillus
Streptococcus

...

Lactate utilizing

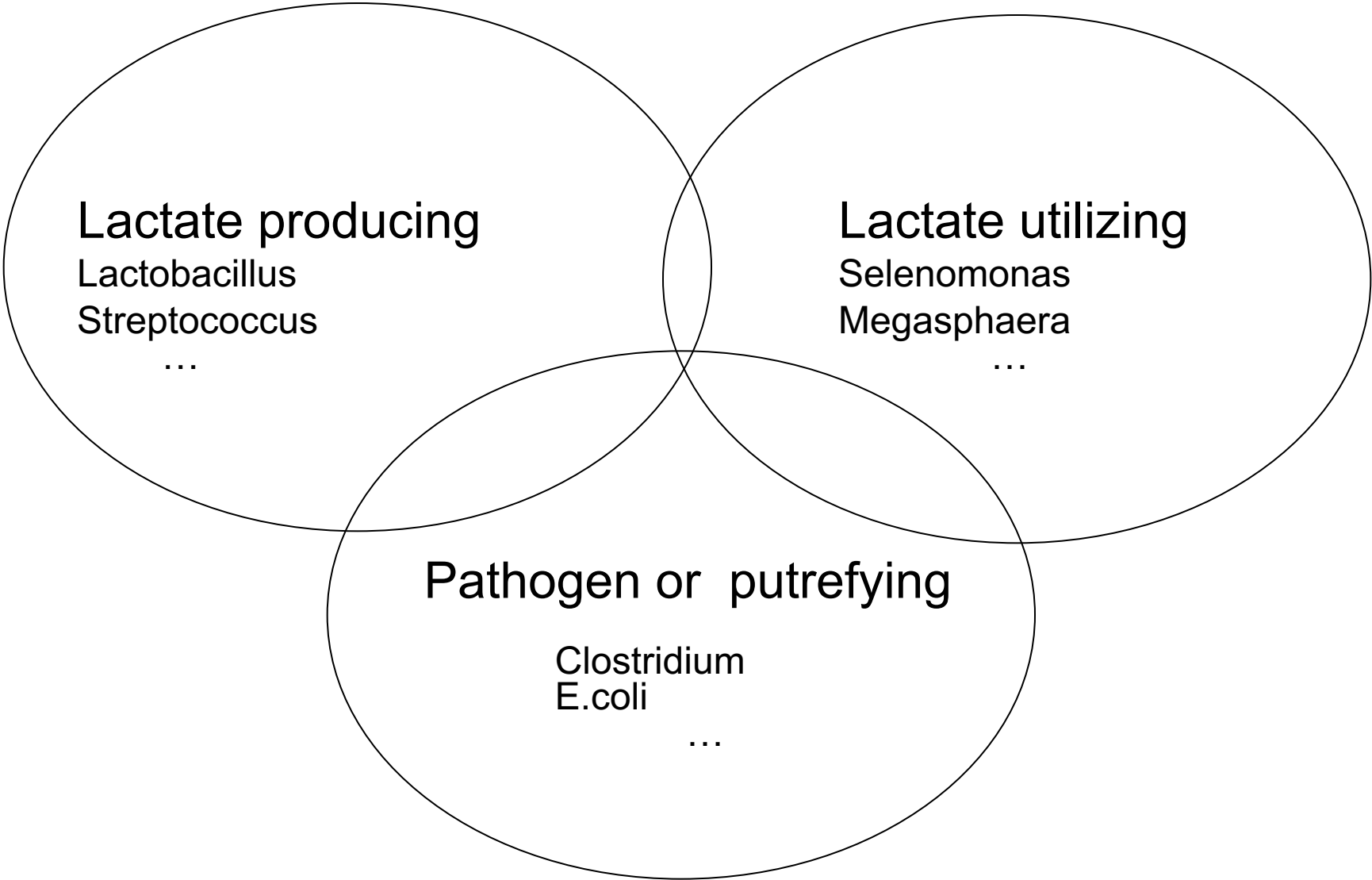
Selenomonas
Megasphaera

...

Pathogen or putrefying

Clostridium
E.coli

...



A) Prebiotics

- Improvement of the microbial quality of droppings
- Decrease of the risk of colic
- Optimisation of fermentation and pH
- Improvement of insulin sensitivity

A) Prebiotics

- Prevent dysbacteriosis following a change in feeding
- Reduce the risk of gastric ulcers
- Potentially improve colostrum quality

A) Prebiotics

- Improve epithelial barrier function (PRR agonist)
- Seem to improve normal cells development and function (VFA)

A) Prebiotics

- Use the right dose
- During the adequate period
- Target your population

A) Prebiotics

- Use the right dose (scFOS)
- 0.05g/Kg minimum
- Risk of laminitis over 2 to 5g/Kg

A) Prebiotics

- During the adequate period (10 days minimum)
- Target your population

- Stress
- Feed change
- Transport
- Competition
- Weaning

A) Prebiotics

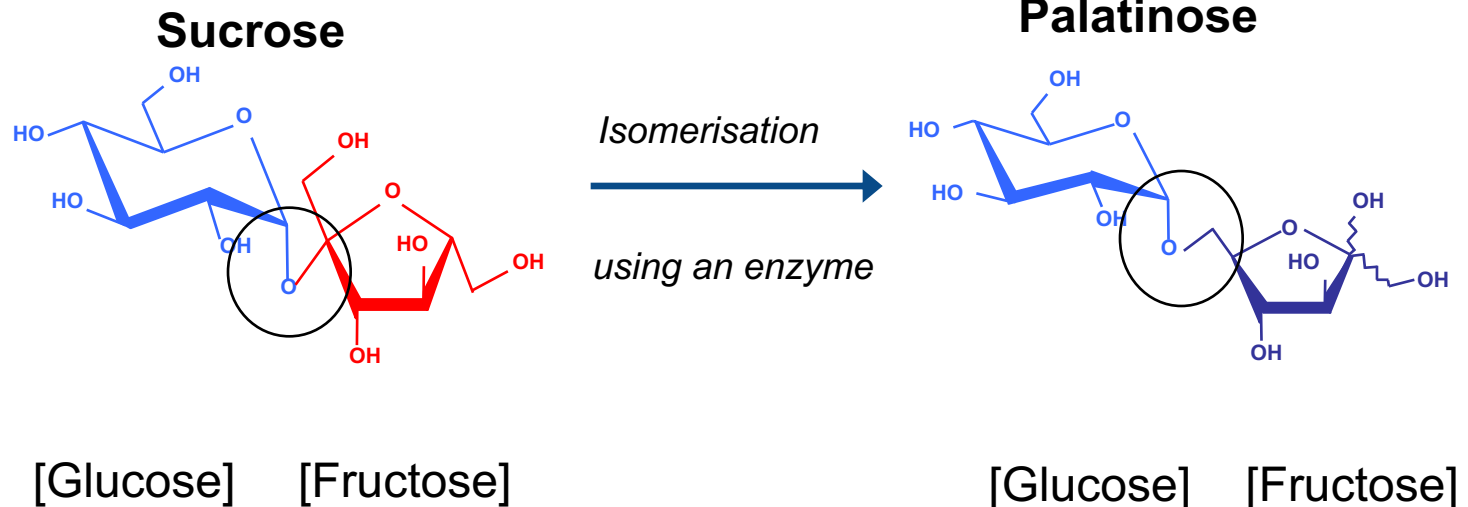
TWYDIL® GROWING
TWYDIL® STUD
TWYDIL® HEMOPAR
TWYDIL® CALMIN
TWYDIL® MUCOPROTECT
TWYDIL® VIGORADE
TWYDIL®STOMACARE

B) Isomeric sugar

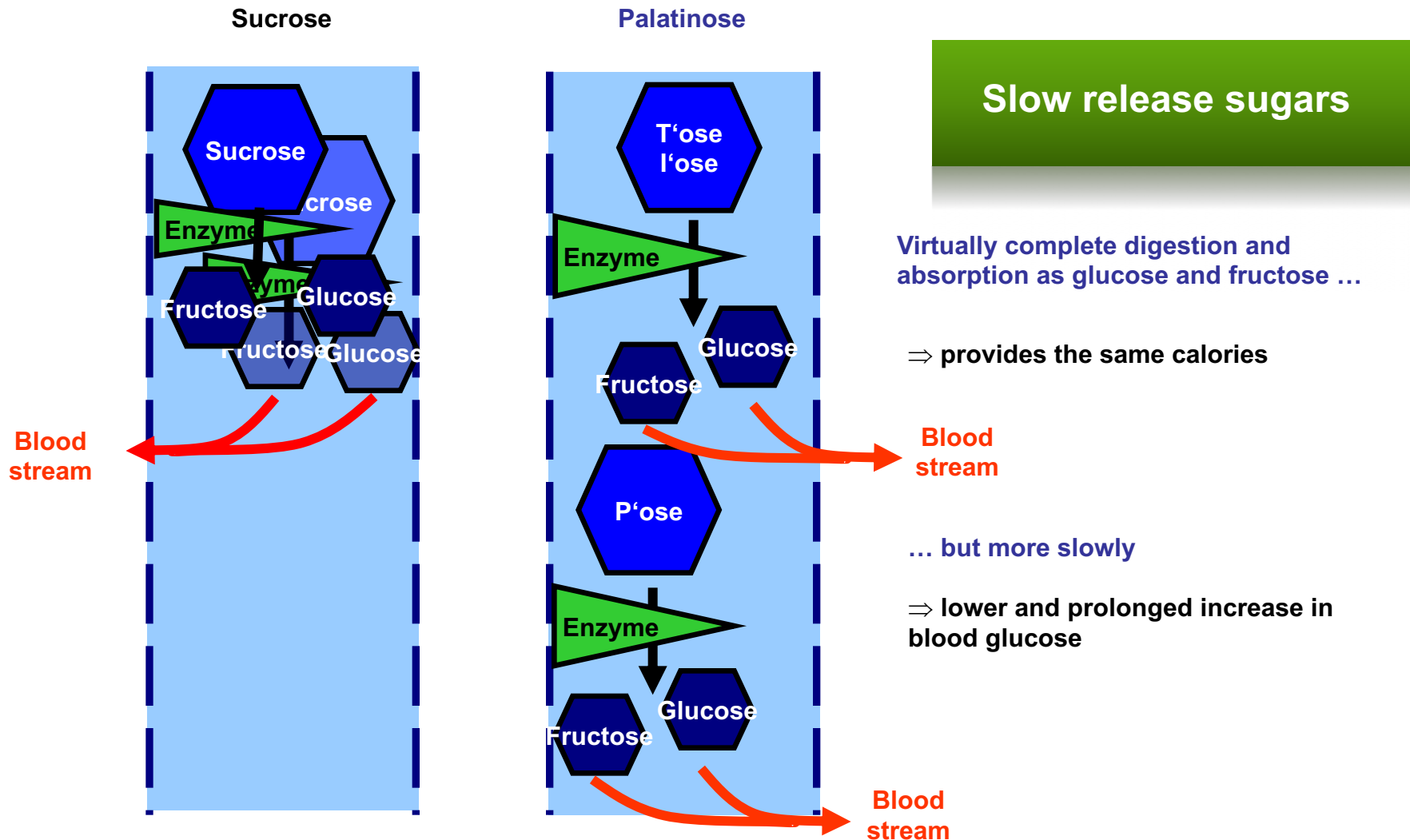
– Classification

- Disaccharide of fructose and glucose
- An isomer of sucrose

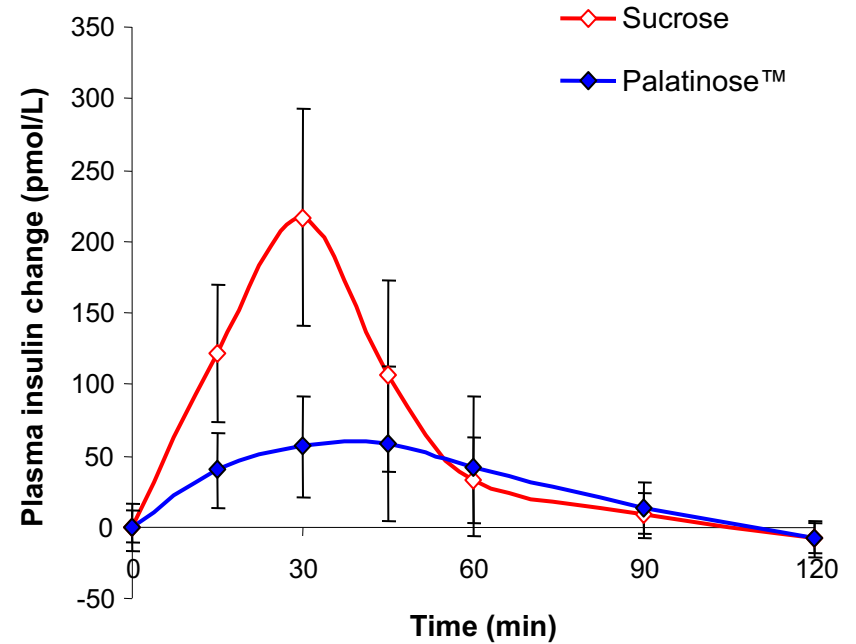
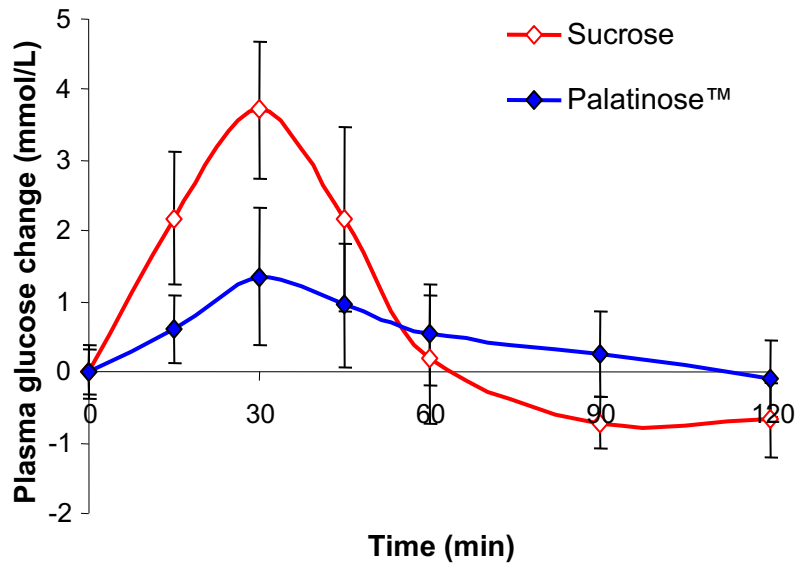
– Production: enzymatic conversion



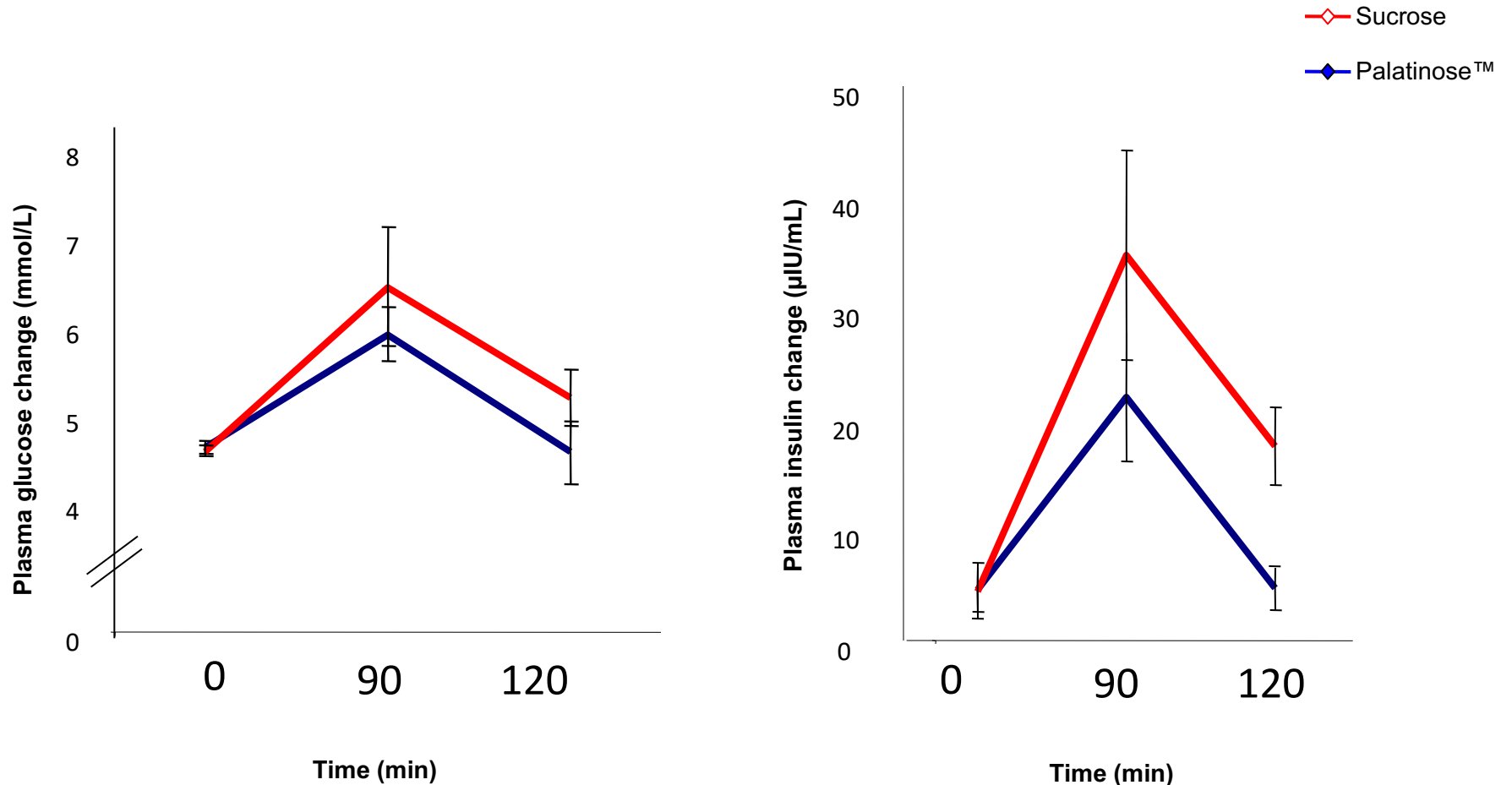
B) Isomeric sugar



B) Isomeric sugar



B) Isomeric sugar



B) Isomeric sugar

Advantage:

Reduction of insulin peak is beneficial even for young animals

Prevention :

Tying-up

Obesity

Metabolic syndrome development

Laminitis

OCD

B) Isomeric sugar

Feed manufacturer

Vs

Feed supplement

15 to 50 % amidon

30-50% of matrix

2 to 8% of sugar (molasses,...)

sugar (mostly dextrose)

Average of 4Kg/day

20 to 160g

B) Isomeric sugar

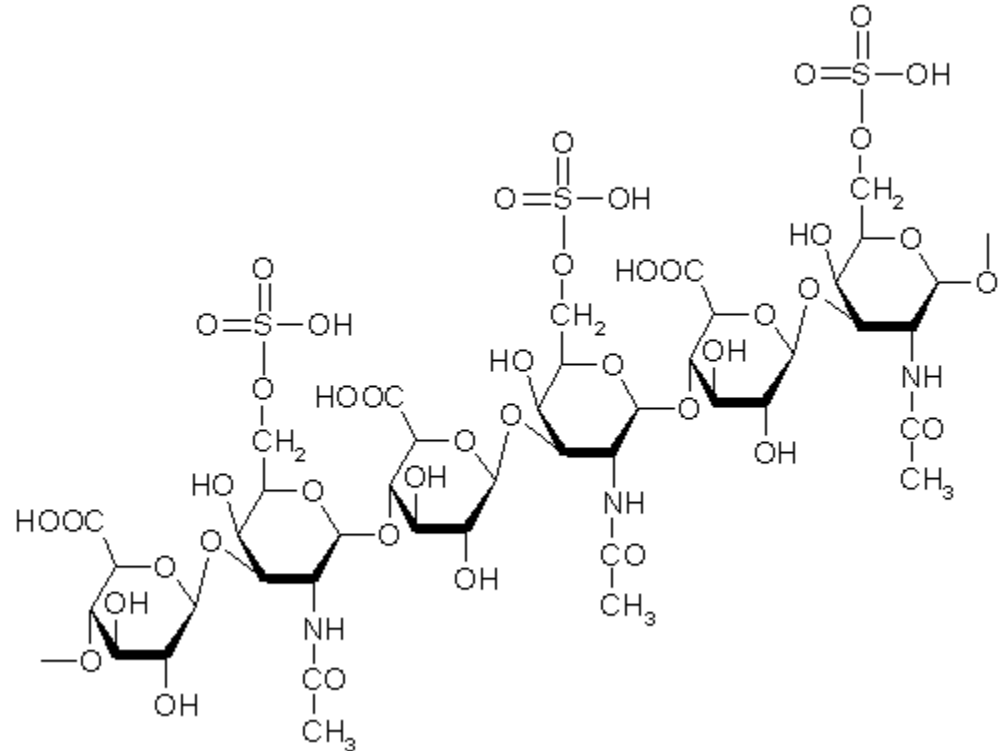
TWYDIL® ARTRIDIL
TWYDIL® CALMIN
TWYDIL® ELECTROLYTES
TWYDIL® MUCOPROTECT
TWYDIL® PROTECT+
TWYDIL® TWYBLID
TWYDIL® VIGORADE

Significantly improved appetite

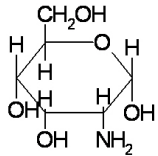
C) Amino-sugar

2-Amino-2-deoxy-D-glucose

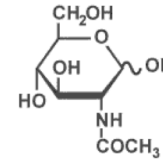
Sulphate de chondroïtine



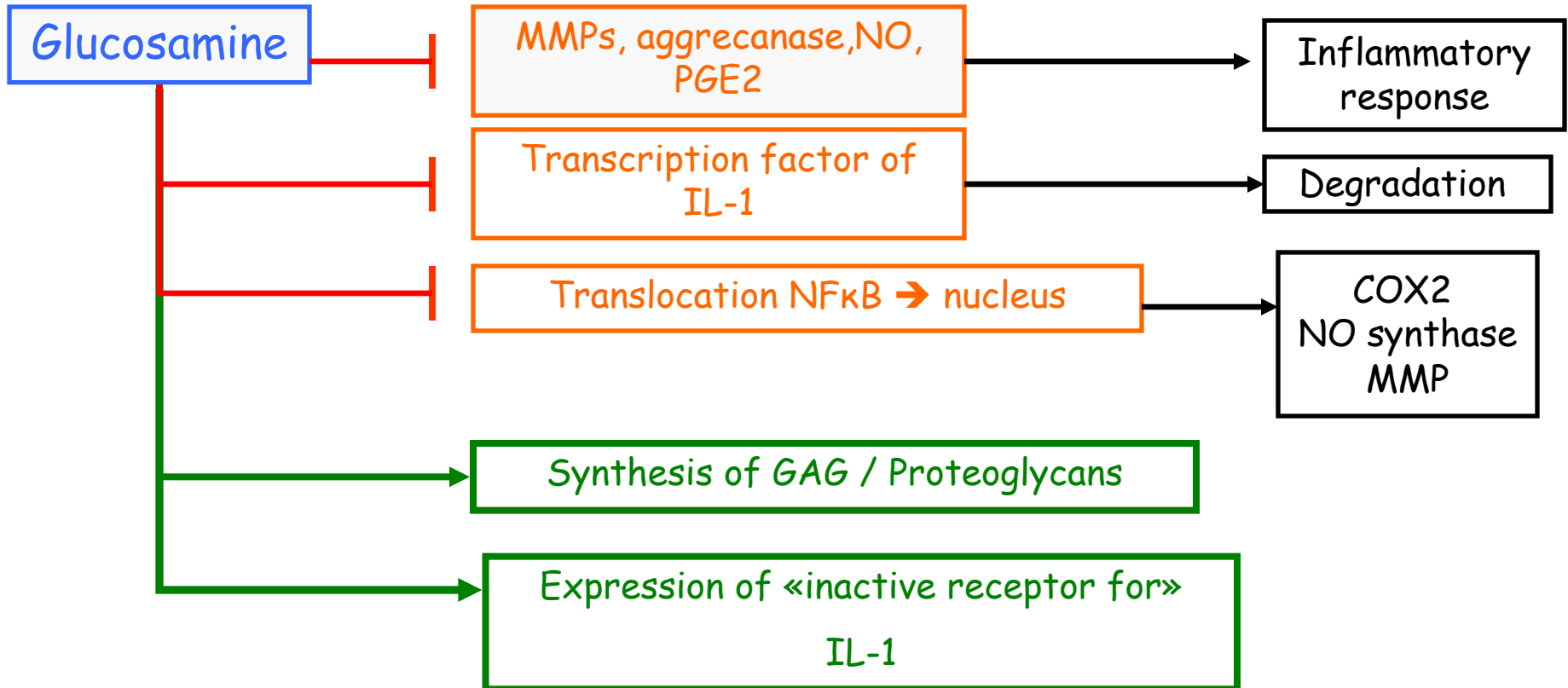
C) Amino-sugar



Molecular Structure of Glucosamine

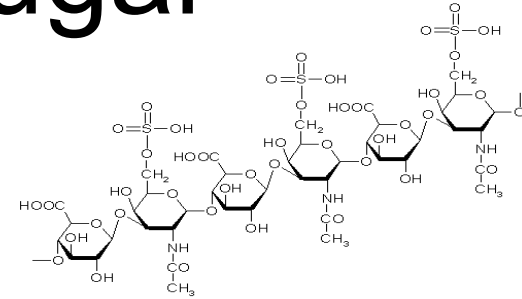


N-acetyl Glucosamine



C) Amino-sugar

Chondroitin sulfate



Lytic enzymes (activated by PGE2/NO)

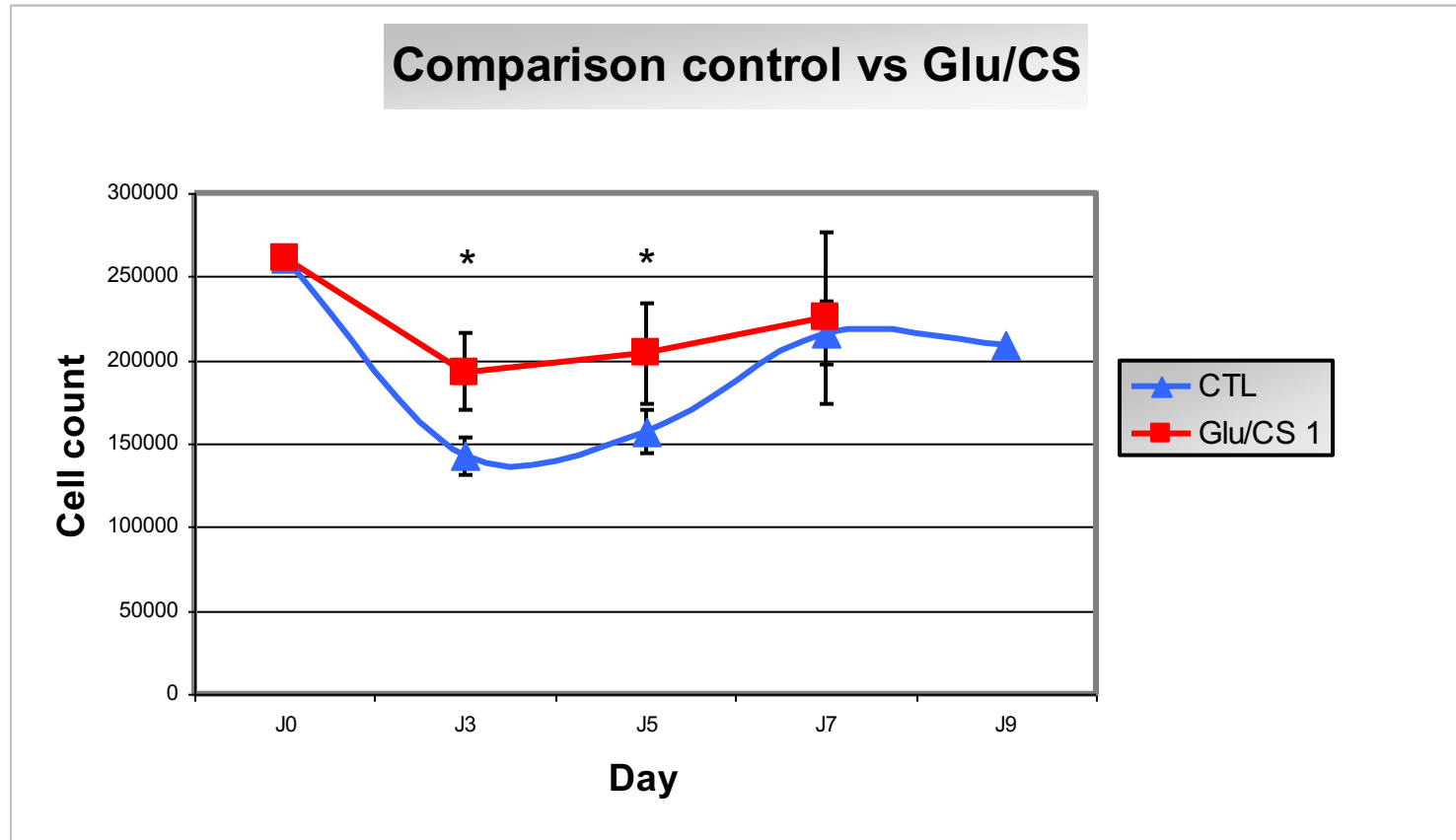
IL-1 → collagene II/MMP

Concentration en HA → Synovial viscosity +++

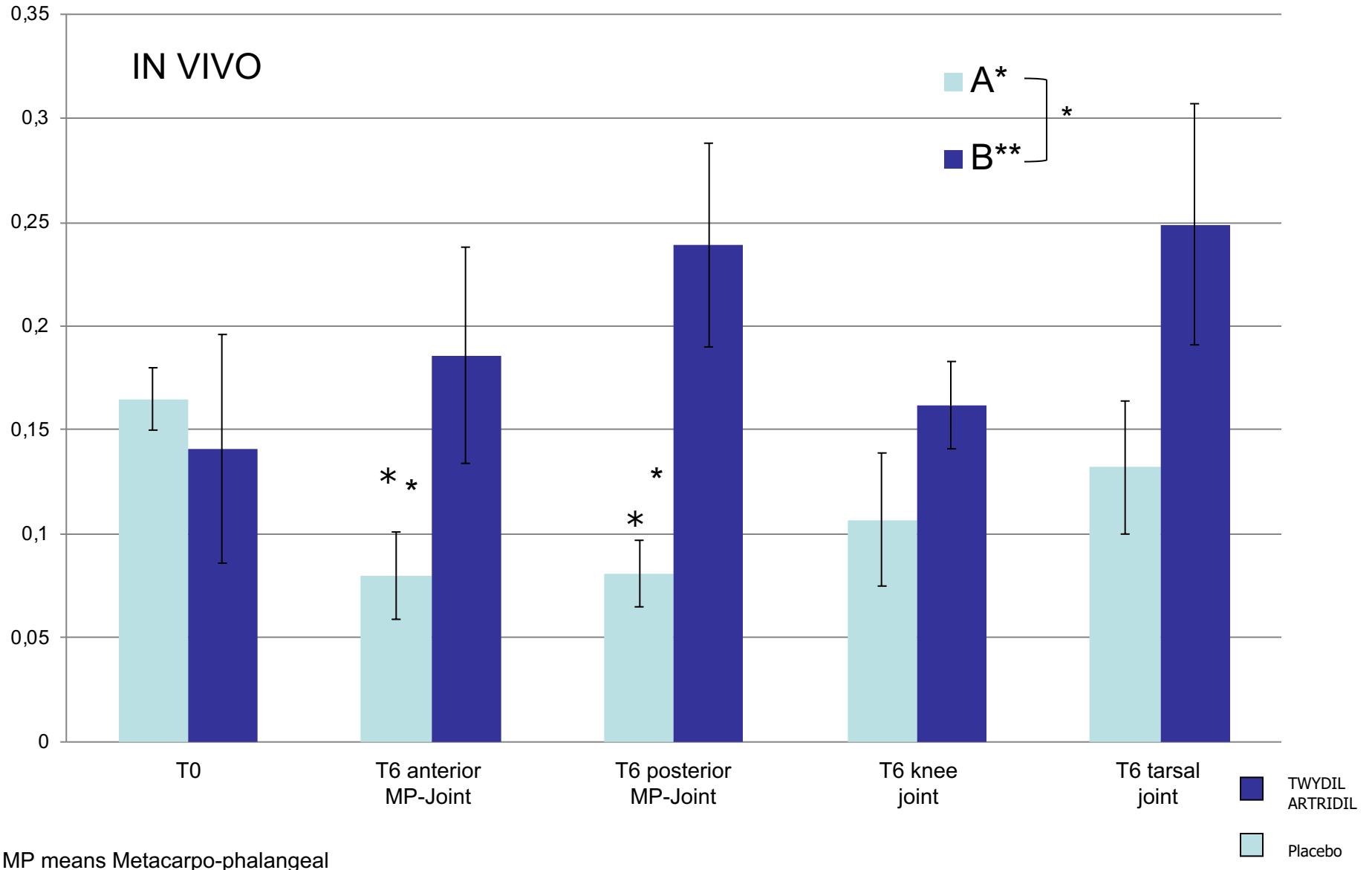
Synthesis of GAG

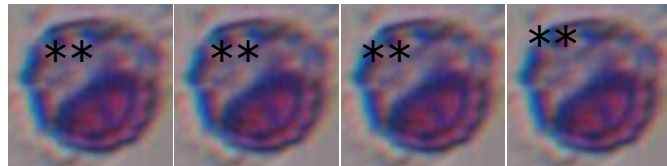
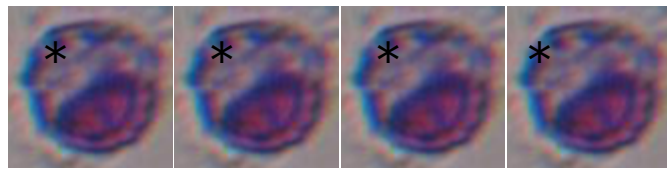
C) Amino-sugar

IN VITRO

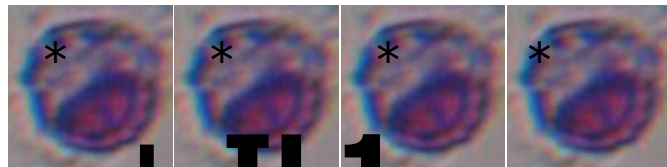


MMP9 activity in synovial fluid

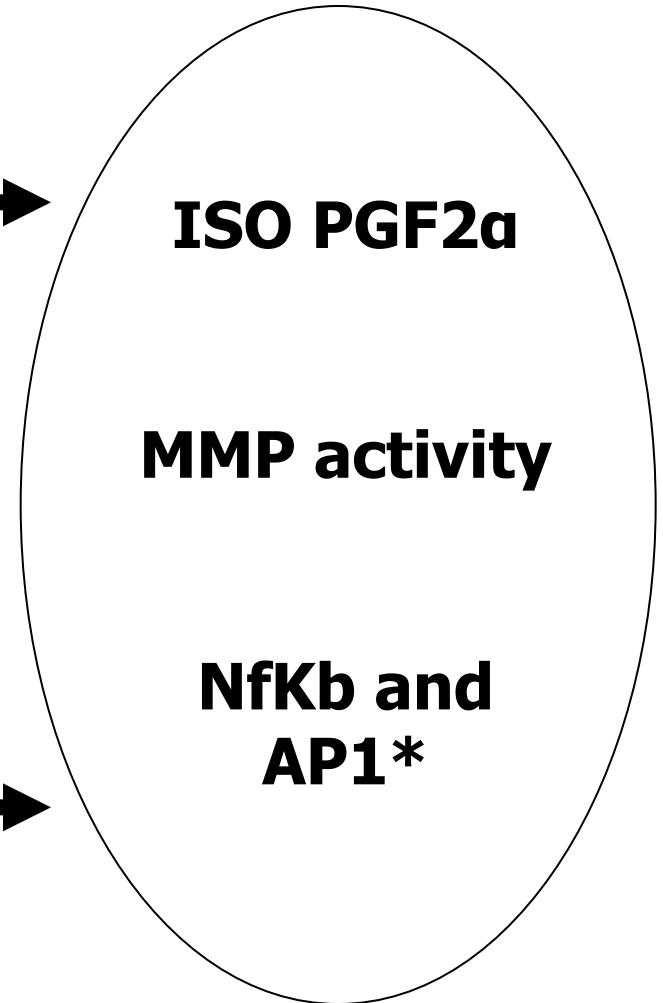
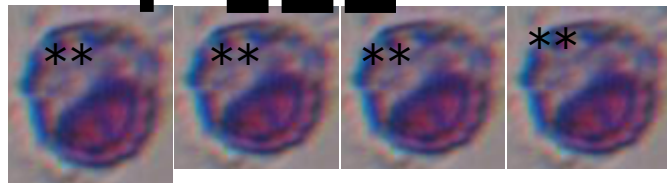




EX VIVO

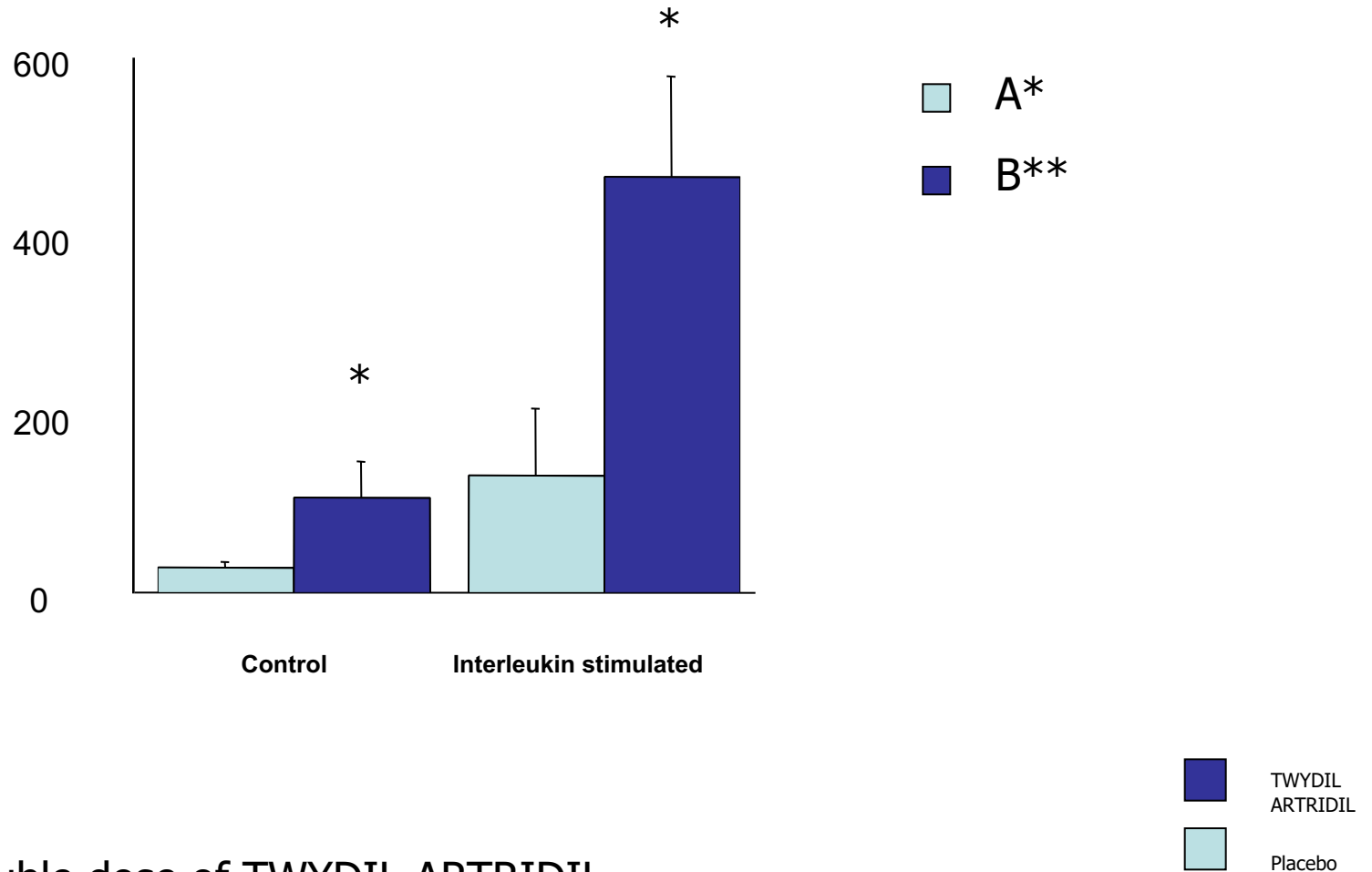


+ **IL1**



* Second experimentation made with double dose of TWYDIL ARTRIDIL

Isoprostane, MMP2 and NfKb\$ production in cultured chondrocytes



\$ Test with double dose of TWYDIL ARTRIDIL

C) Amino-sugar

TWYDIL®ARTRIDIL

C) Amino-sugar

Modulates the articular enzymatic balance

Decreases the expression of the main pro-inflammatory transcriptional factor

Conditions of efficacy

- Target the correct population
- Selection of the appropriate cocktail or molecule
- Dosage, duration of administration
- Lack of toxicity
- Lack of irreversible damages