LINTJESHOF
dierenartsen diagnostiek apotheek

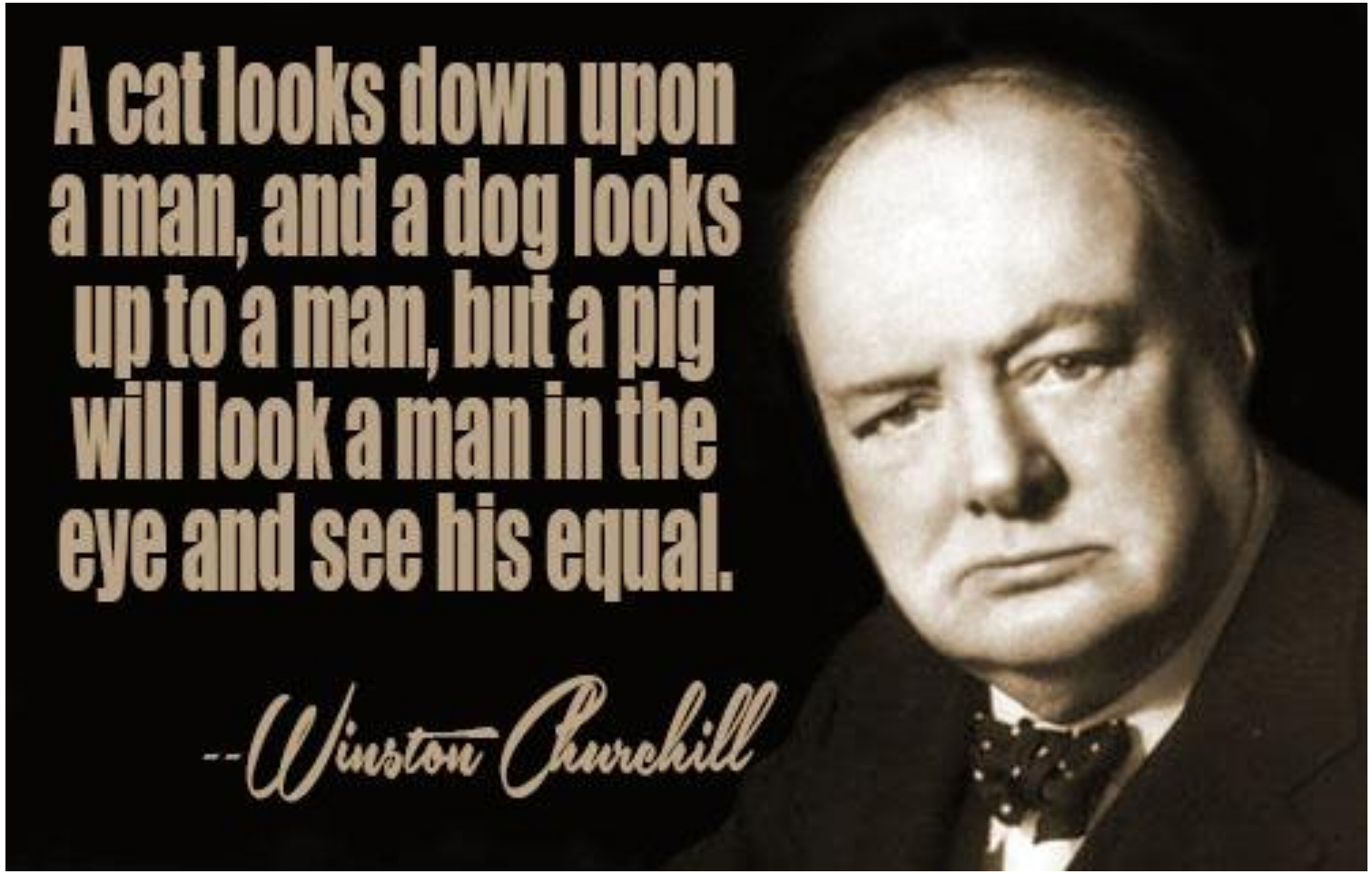
AOAC Lowlands
Symposium Darmgezondheid: Gezondheid zit in de darmen
21 september 2017; Breda; Nederland

AOAC INTERNATIONAL
LOWLANDS SECTION

Van dysbiosis naar eubiosis: kansen voor innovatieve natuurlijk producten

S

Dr . Sam De Snoeck


A cat looks down upon a man, and a dog looks up to a man, but a pig will look a man in the eye and see his equal.
--Winston Churchill

LINTJESHOF

dierenartsen diagnostiek apotheek

Ondernemer met de ondernemers

LINTJESHOF
dierenartsen diagnostiek apotheek

Snelle diagnostiek/ Kenniscentrum

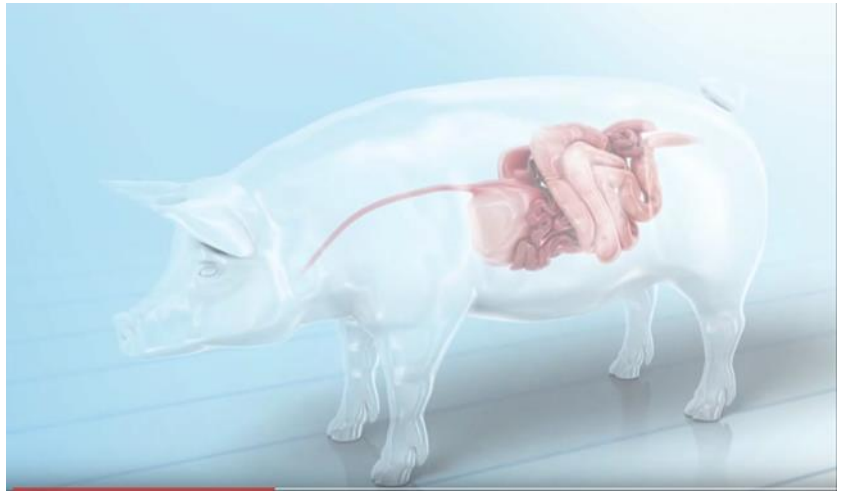
Begeleiding en preventie staan voorop: duurzame varkenshouderij

Waar **gaan** we het over hebben?

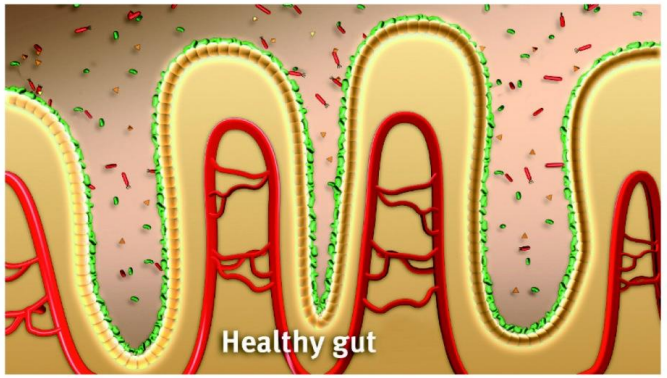
1/ Effecten van dysbiosis

2/ Eubiotica : pro-/prebiotica/org.zuren /phytobiotica

3/ Research/ veldproeven



Eubiosis



Dysbiosis

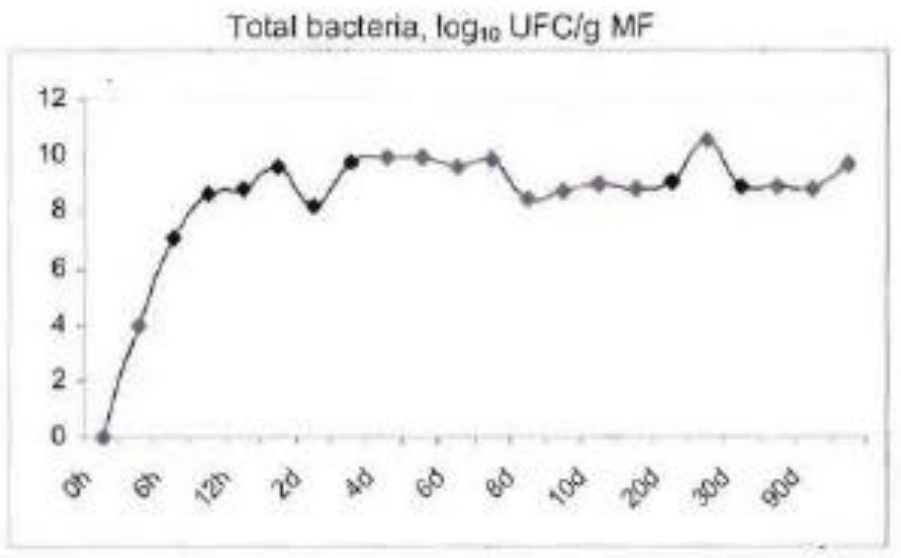
Lactobacillus

E. colli Salmonella

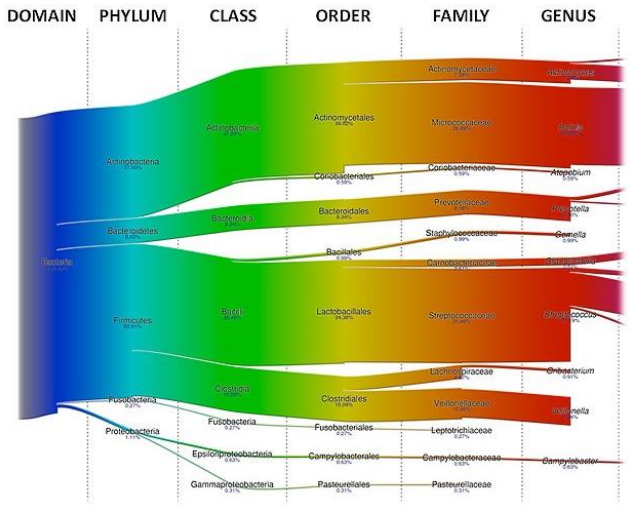
Streptococcus / Staphylococcus
Clostridium

Nutrients

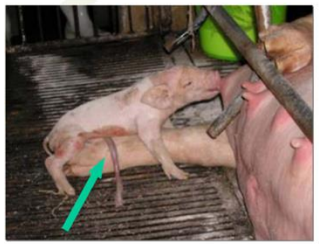
The main differences between a healthy and a damaged intestinal wall are: A damaged gut wall contains more bacteria; is in dysbiosis due to pathogen pressure; has more lesions; poorer tight junctions, resulting in translocation of bacteria; and has shorter villi.

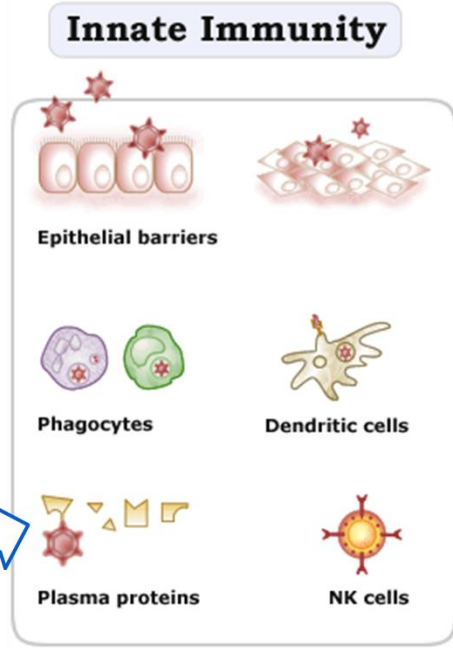


Samenstelling darmflora big

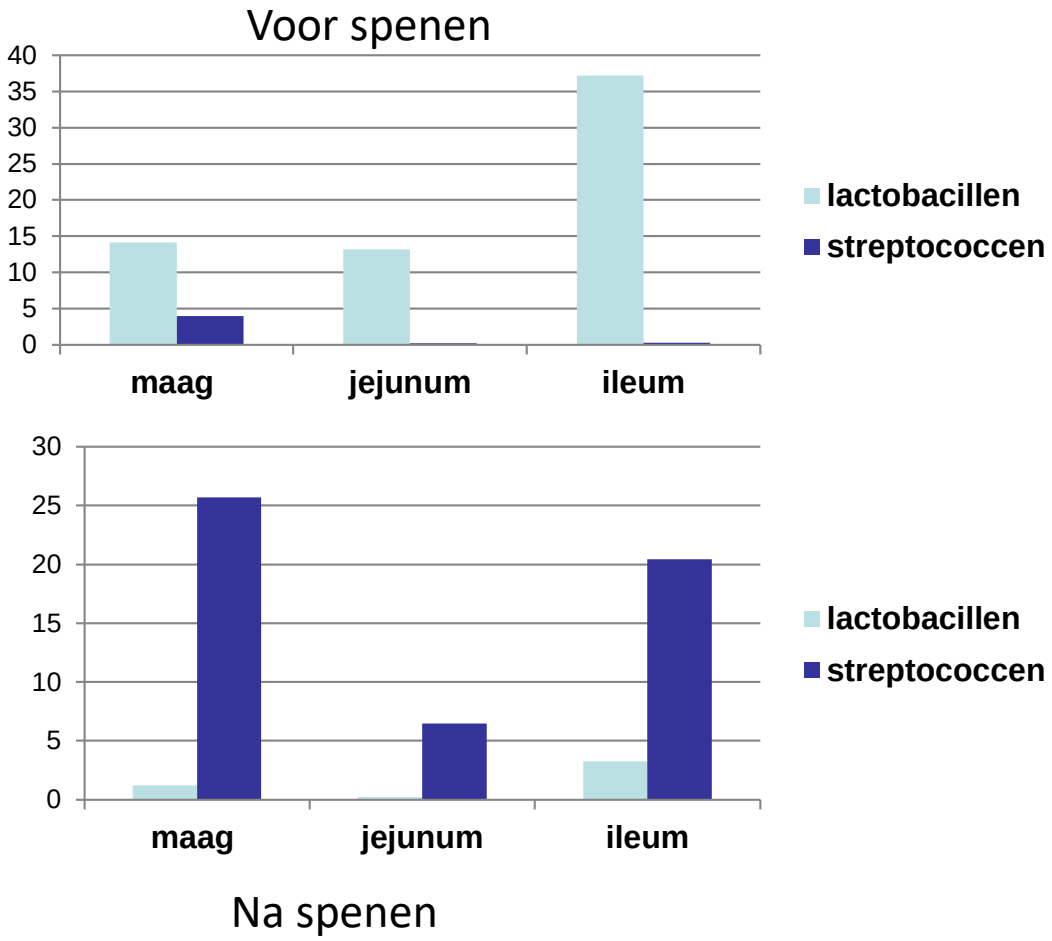


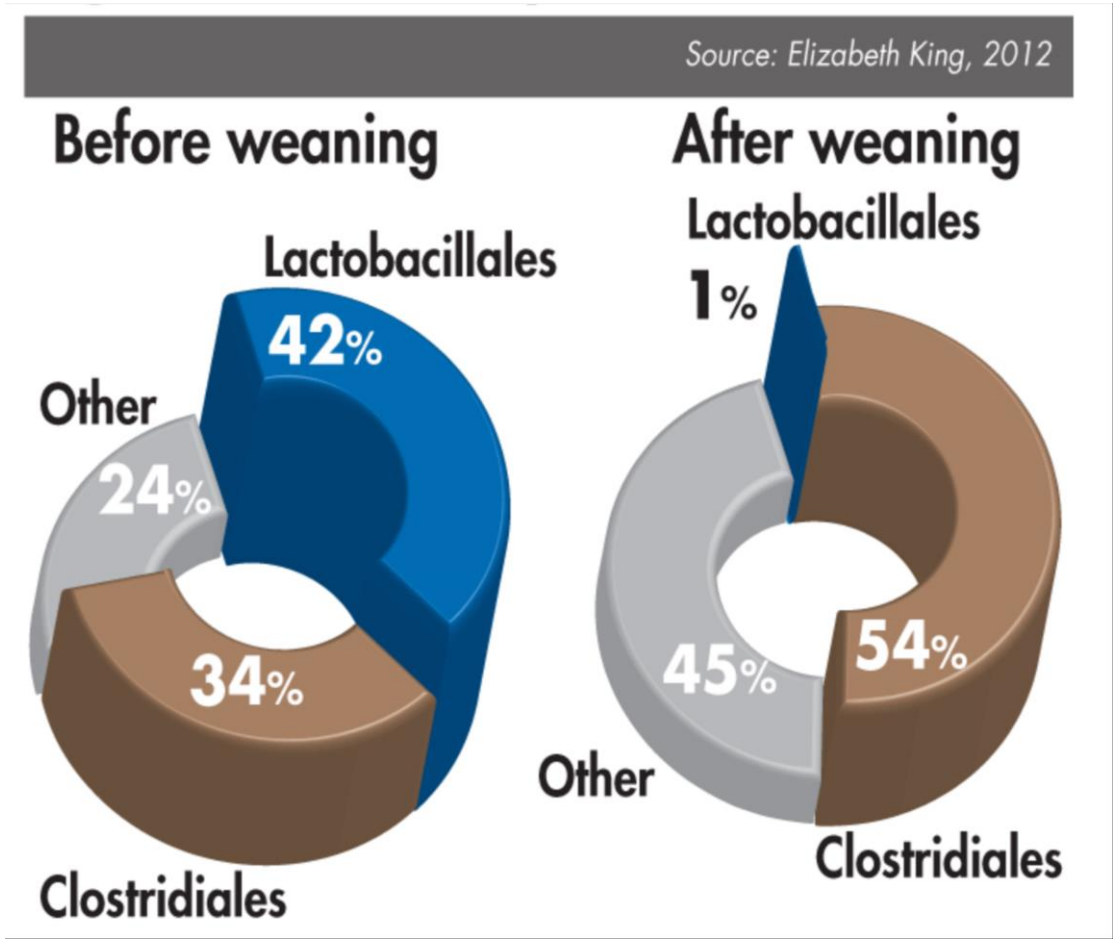
Colostrum !!!

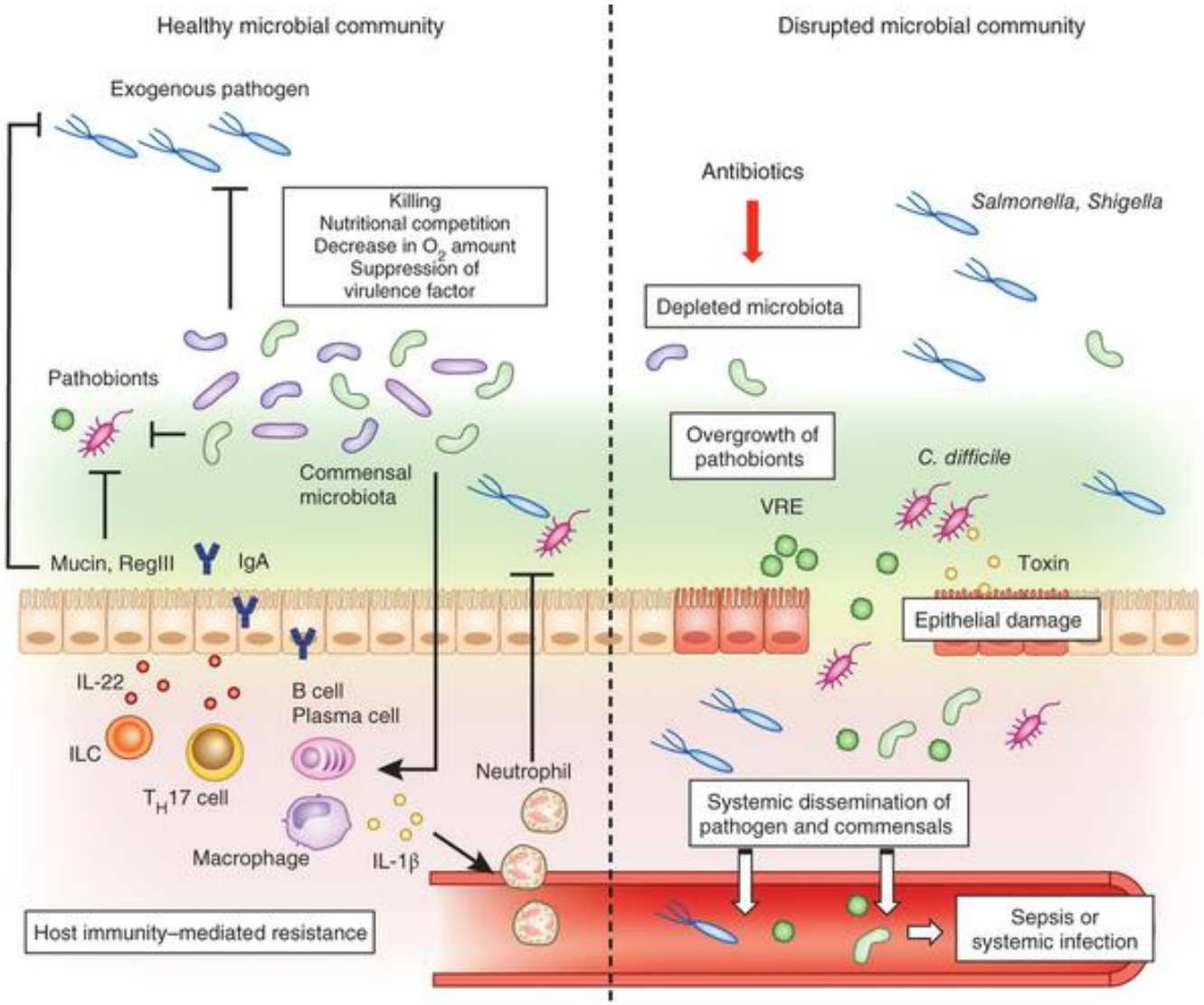




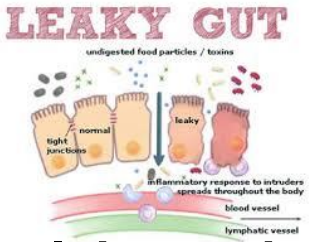
Geen antibiotica !!!


Voor spenen
40
35
30
25
20
15
10
5
0
maag
jejunum
ileum
lactobacillen
streptococcen
30
25
20
15
10
5
0
maag
jejunum
ileum
lactobacillen
streptococcen
Na spenen

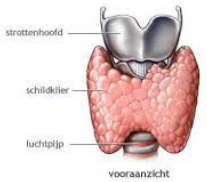

Source: Elizabeth King, 2012
Before weaning
Lactobacillales
42%
Other
24%
34%
Clostridiales
After weaning
Lactobacillales
1%
45%
54%
Other
Clostridiales


Healthy microbial community
Disrupted microbial community
Exogenous pathogen
Killing
Nutritional competition
Decrease in O_2 amount
Suppression of virulence factor
Pathobionts
Commensal microbiota
Mucin, RegIII
IgA
IL-22
ILC
T_H17 cell
B cell
Plasma cell
Macrophage
IL-1β
Neutrophil
Host immunity–mediated resistance
Antibiotics
Depleted microbiota
Salmonella, Shigella
Overgrowth of pathobionts
C. difficile
VRE
Toxin
Epithelial damage
Systemic dissemination of pathogen and commensals
Sepsis or systemic infection

Serotonine / dopamine ↓



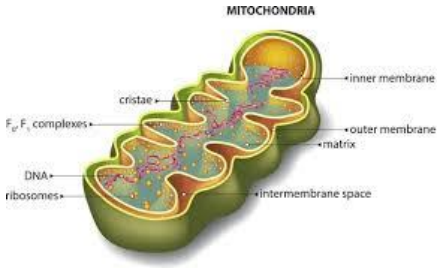
Malabsorptie



T3 → T4 ↓
TSH ↓

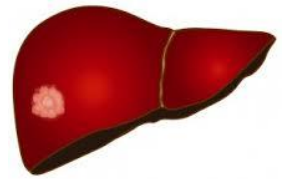
Glutathion ↓

Grhreline ↑ / Leptine ↓



ATP ↓

LPS



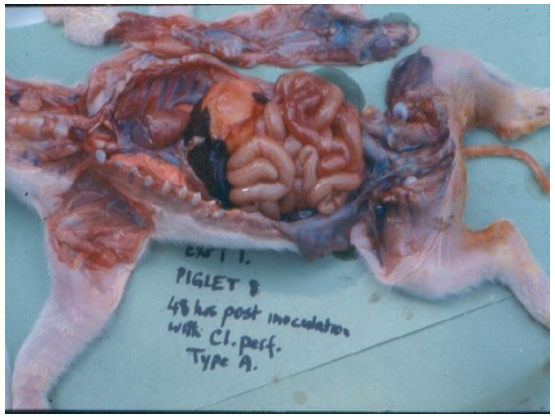
Afb . 18: Tumor in de lever

Ontsteking/ oxidatieve stress

ACTH ↓

Zn ↓

Intestinal content in a serious case of diarrhea due to rotavirus. Author: L Carrasco



Coli/Clostridium/Rota/PED

Small intestine of a piglet with colibacillosis

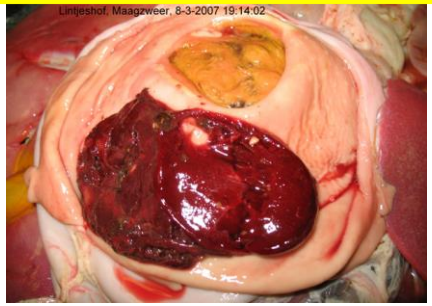
Fecal-stained perineum
Author: Jesús Bollo

Oploper

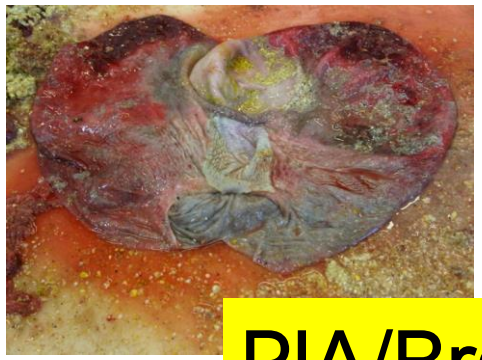
Maagdarmprolaps

Rectal prolaps

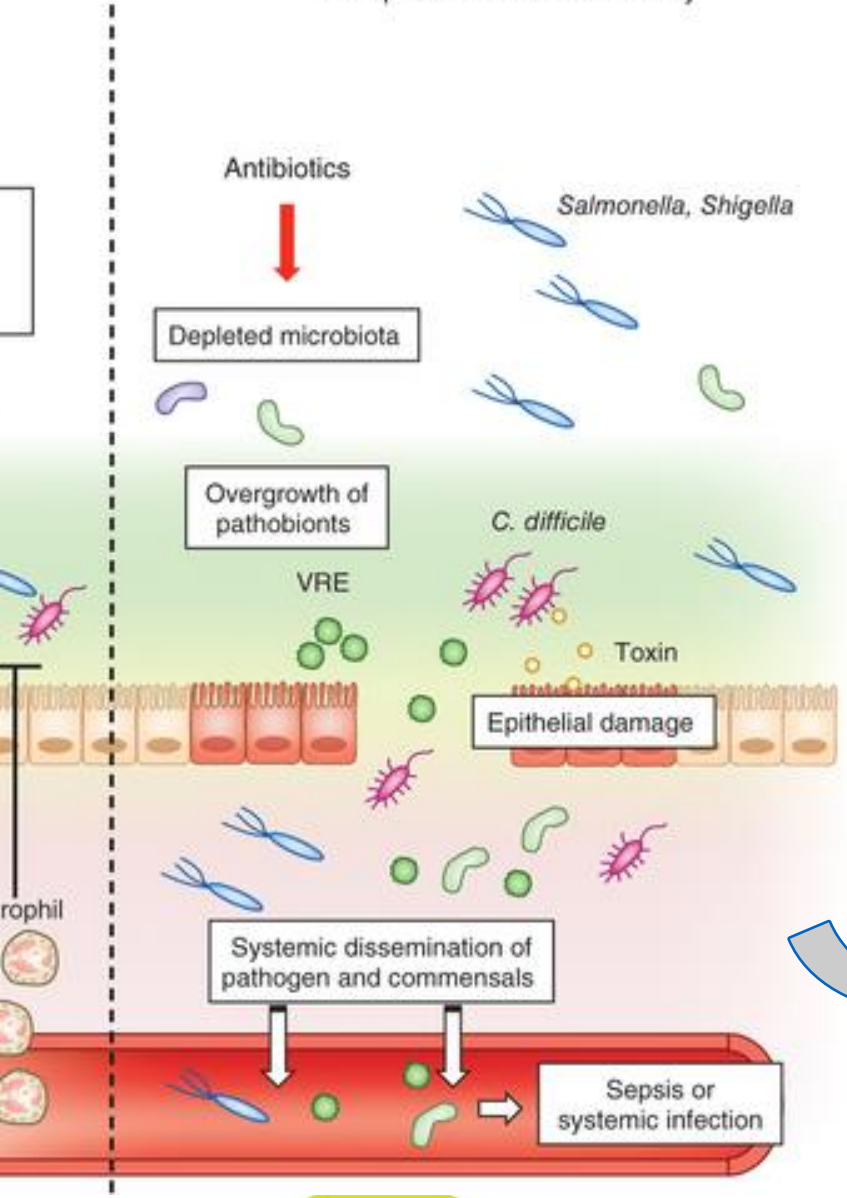
Maagzweer

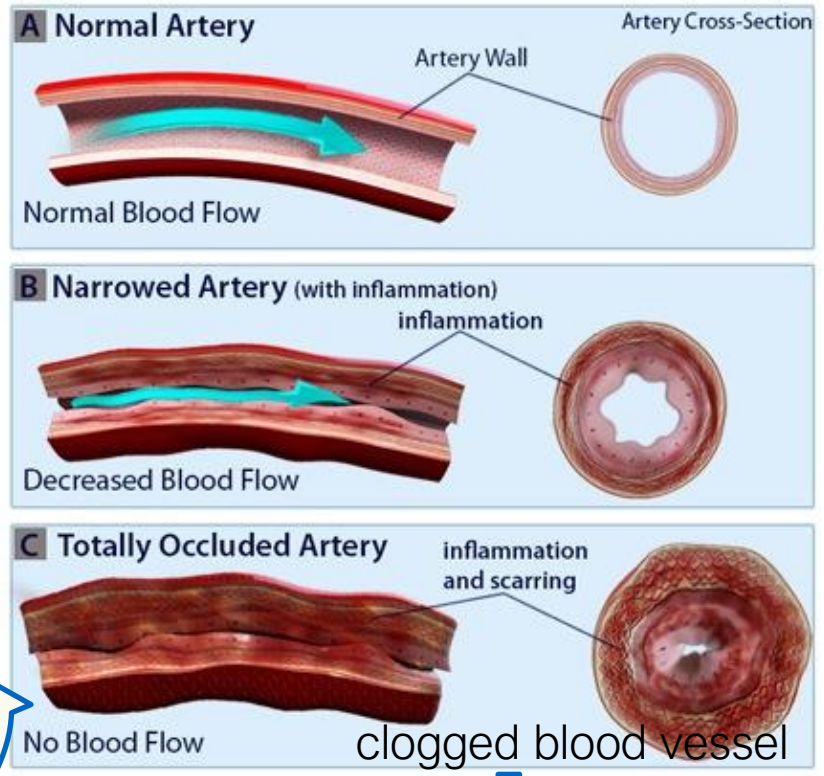


Gastritis



PIA/Brachyspira/Salmonella/ Clostridium novyi





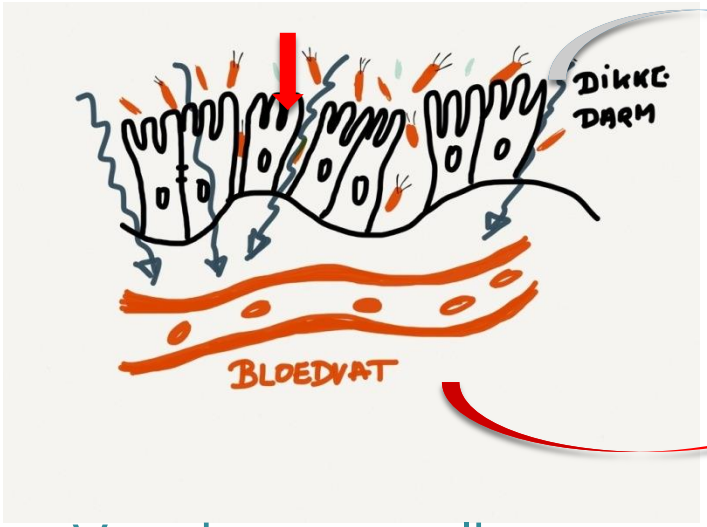
clogged blood vessel

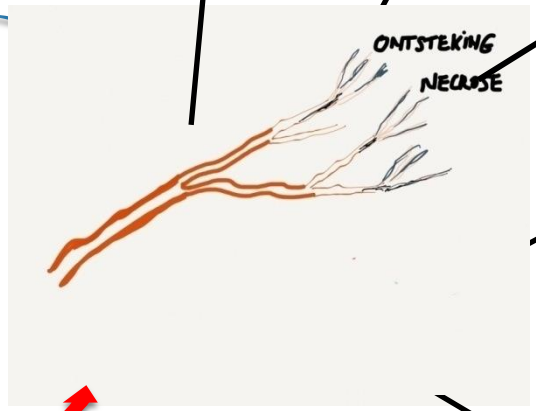
disturbed blood flow >> necrosis

Kannibalisme

S.Suis

LPS Toxines (Celwand van Gram negative bacterie)



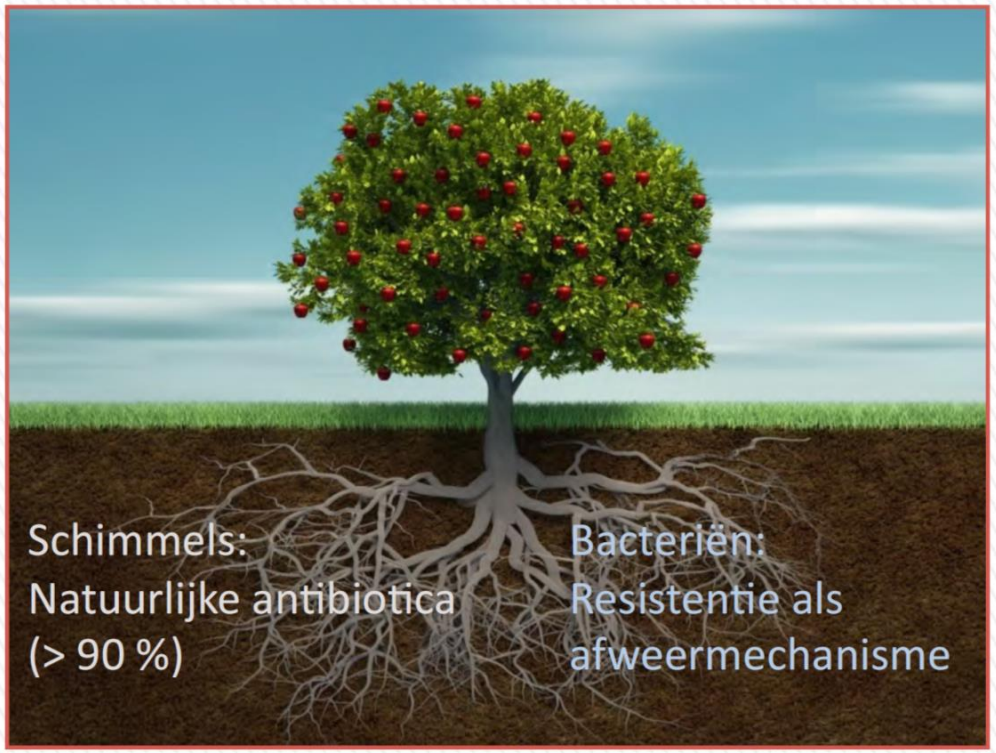


Laminitis

Osteochondrosis

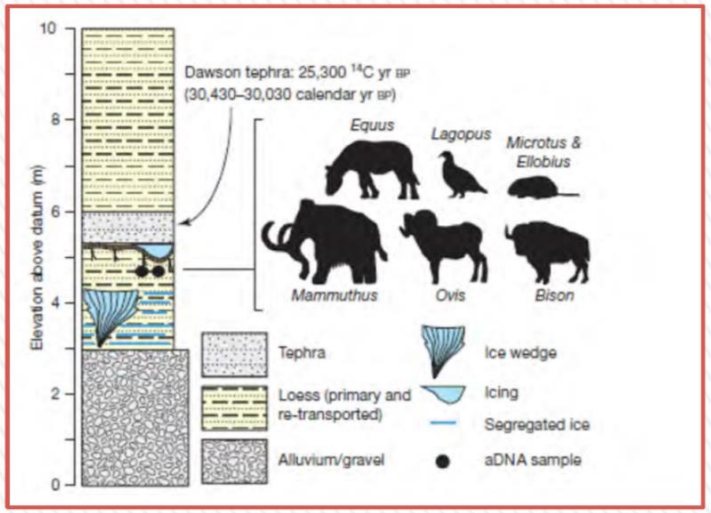
Vorming van melkzuur : metabole acidose /
Biogene Amines: allergische reactie

De natuur uit balans?



"Antimicrobial resistance is ancient"

Nature; 2012



AMGPs

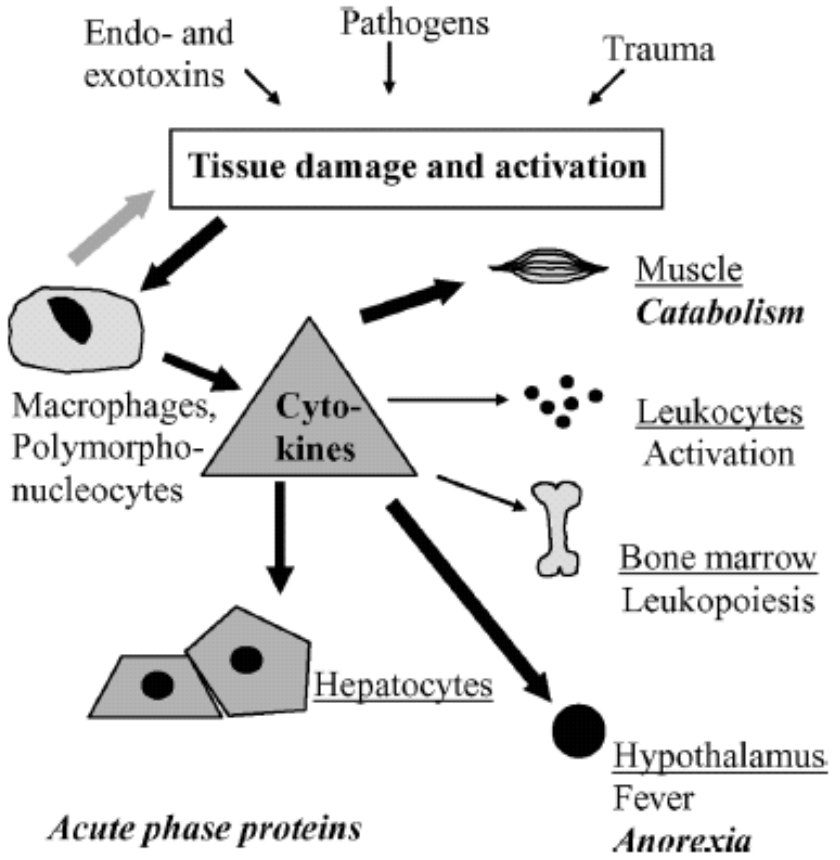
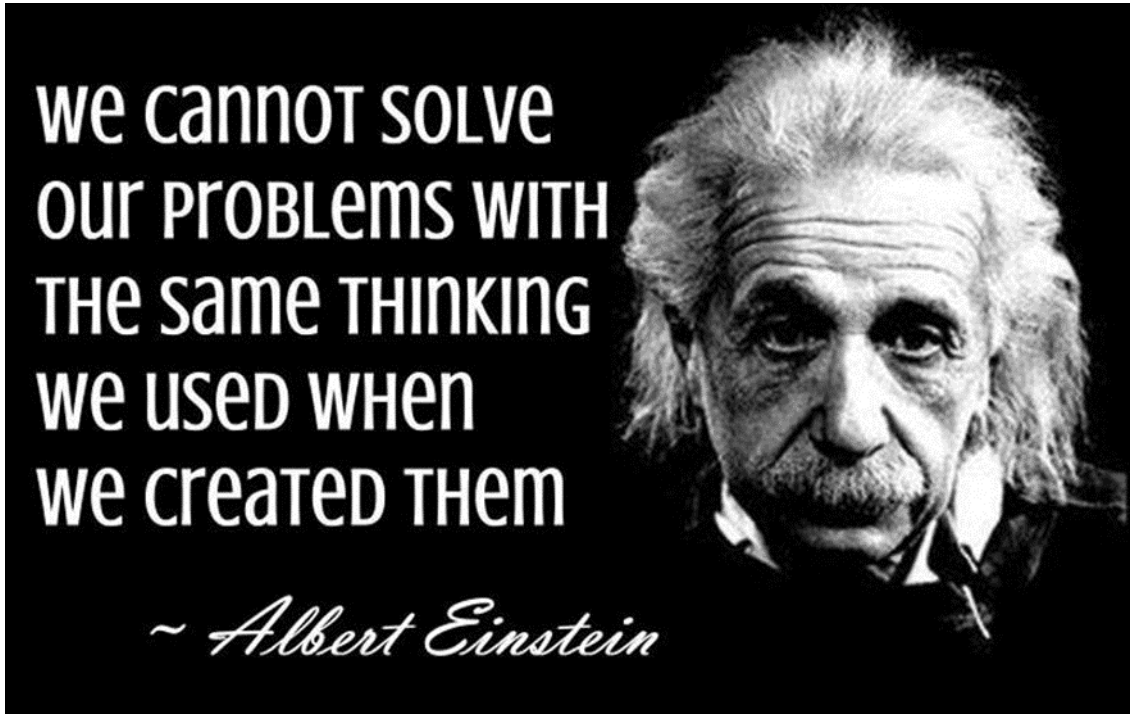
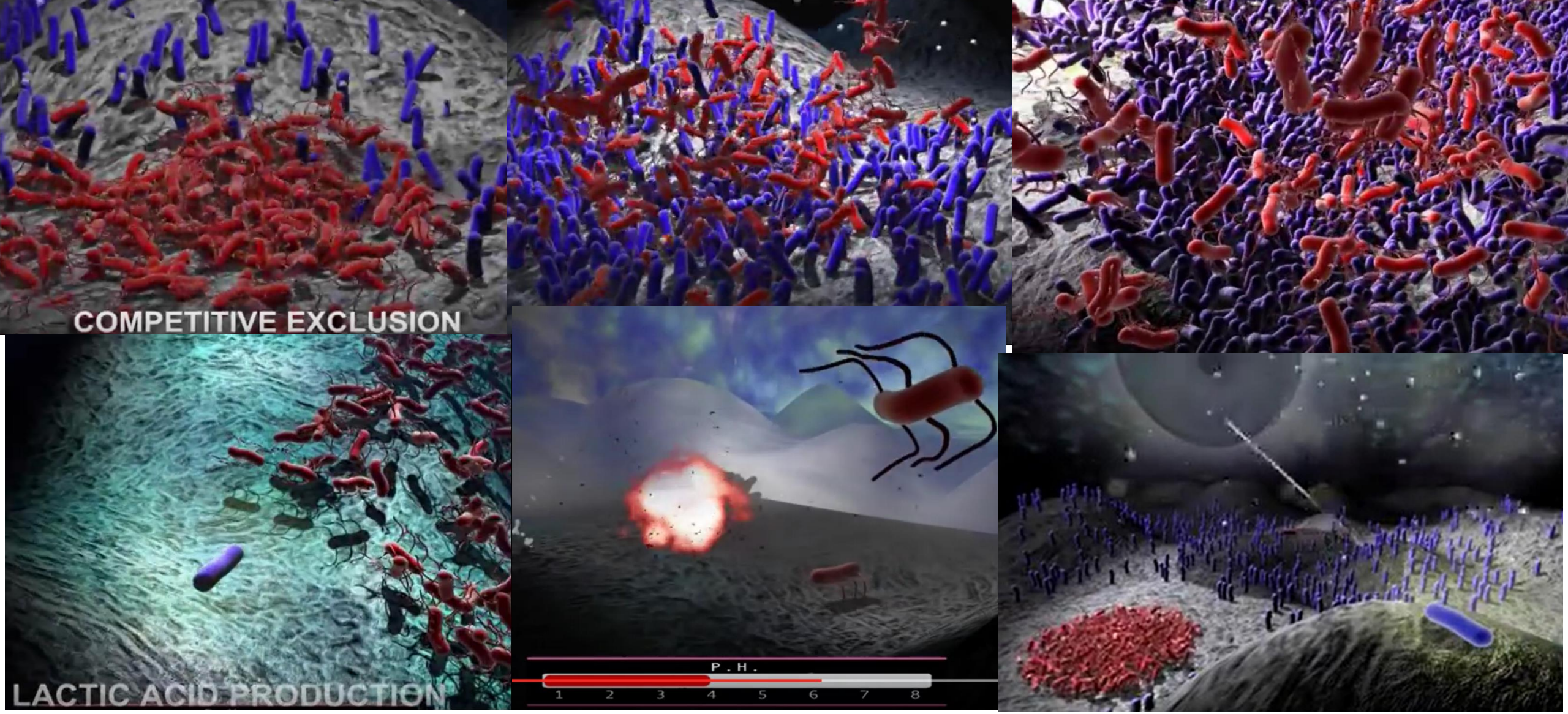


Figure 1. Schematic representation of the inflammatory response (modified after Jacobsen, 2003). Inflammatory cells are activated by tissue damage, causing production and excretion of proinflammatory cytokines. Circulating cytokines induce responses in different tissues. A reduction of growth results mainly from 3 responses (indicated in boldface italics). If unchecked, the inflammatory response itself can lead to further tissue damage (gray arrow), perpetuating catabolism.

EUBIOTICS



UITDAGING : REDUCTIE ANTIBIOTICA RESISTENTIE/ CHRONISCHE INFECTIES / IMMUUNGEMEDIEERDE ZIEKTES


COMPETITIVE EXCLUSION
LACTIC ACID PRODUCTION
P . H .
1 2 3 4 5 6 7 8

PROBIOTICA

PREBIOTICA

Extraction

Sucrose

Bio-enzymatic transformation

Short-chain fructooligosaccharides

F = Fructose

G = Glucose

GF2

GF3

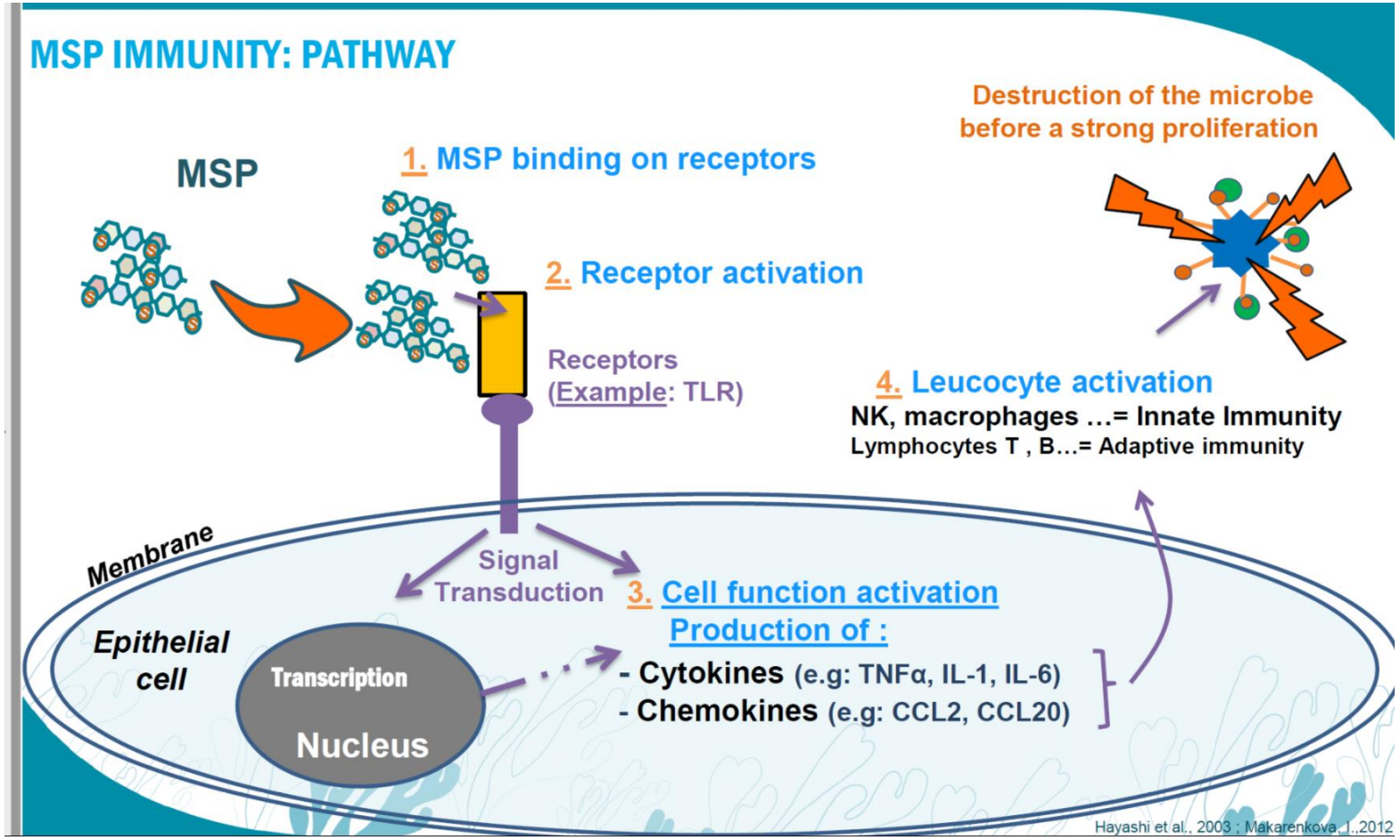
GF4

PROFEED® short chain fructo-oligosaccharides are prebiotics.

Galacto-oligosaccharides

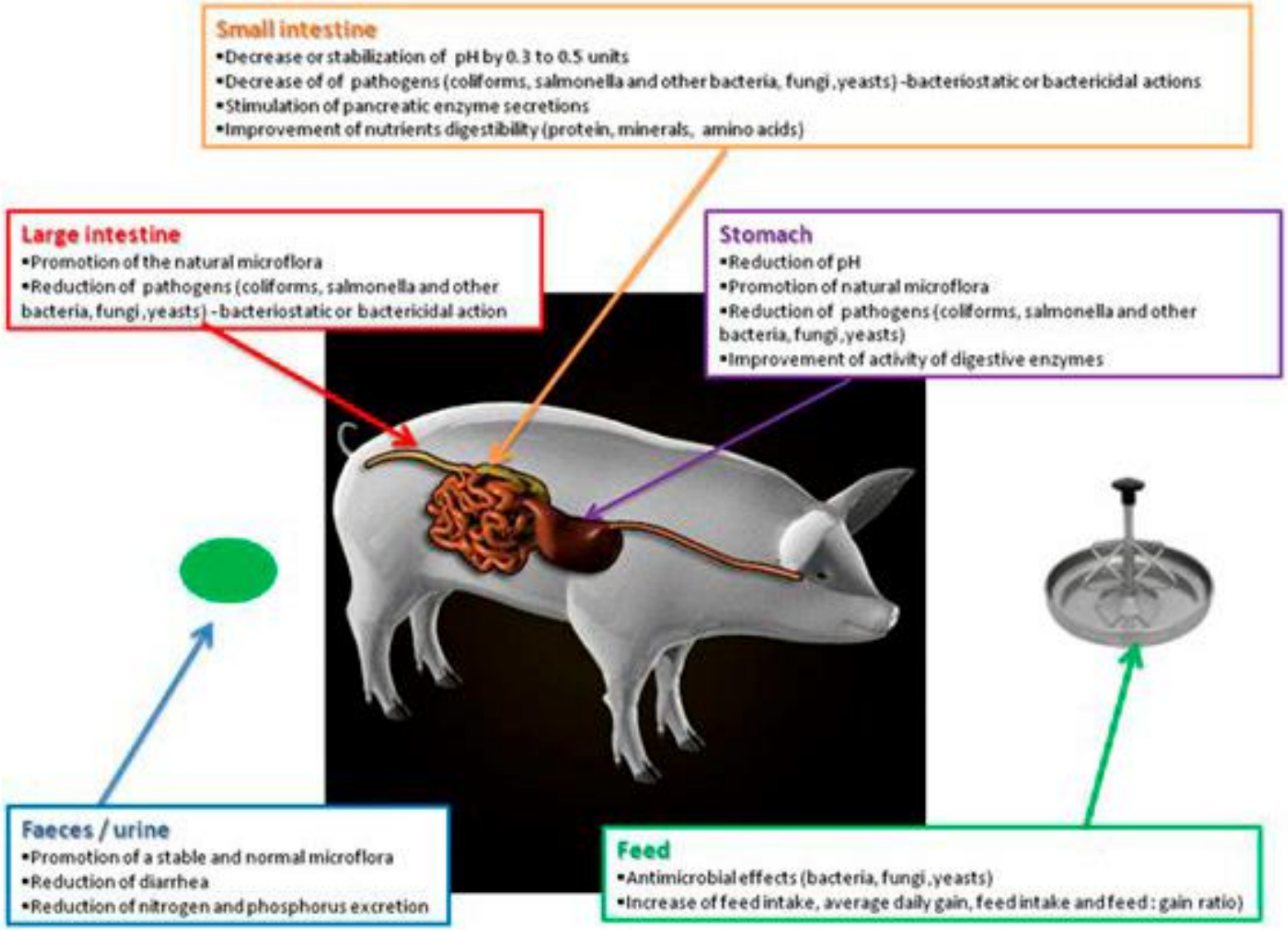
		n=
di	Galactose – Glucose	1
tri	Galactose – Galactose – Glucose	2
tetra	Galactose – Galactose – Galactose – Glucose	3
penta	Galactose – Galactose – Galactose – Galactose – Glucose	4
hexa	Galactose – Galactose – Galactose – Galactose – Galactose – Glucose	5
etc.		

PREBIOTICA


MSP IMMUNITY: PATHWAY
Destruction of the microbe
before a strong proliferation
MSP
1. MSP binding on receptors
2. Receptor activation
Receptors
(Example: TLR)
4. Leucocyte activation
NK, macrophages …= Innate Immunity
Lymphocytes T , B…= Adaptive immunity
Membrane
Signal
Transduction
3. Cell function activation
Production of :
Epithelial
cell
Transcription
Nucleus
- Cytokines (e.g: TNFα, IL-1, IL-6)
- Chemokines (e.g: CCL2, CCL20)
Hayashi et al., 2003 ; Makarenkova, I.,2012

PREBIOTICA

Fig. 1. Mode of action of acidifiers in pig



ORGANISCHE ZUREN

	Gisten	Schimmels	Gram – Bacterie	Gram + Bacterie	Stafylo-Streptococci
Mierenzuur	+++	+	++++	0	0
Azijnzuur	+	+	+++	0	0
Propion zuur	++	++++	++	0	0
Sorbine zuur	+++	+++	+++++	0	0
Benzoëenzuur	+++++	++	+++++	0	0
Citroenzuur	--	--	0	0	0
Melkzuur	++	+	++	0	0
Capryl- en caprien zuur				+++++	+++
Laurine zuur – Glycerol Monolauraat				+++	+++++

ORGANISCHE ZUREN

Phytobiotica :
Plantmetabolieten onderhouden de microbiële diversiteit
Mild antibiotisch , multitarget actie

Dier, Plant en Gezondheid

toegepaste fytotherapie bij landbouwhuisdieren

2007 www.fyto-v.nl

Nederlandse Vereniging voor Fytotherapie

Society for Medicinal Plant and Natural Product Research

Gesellschaft für Arzneipflanzen- und Naturstoff-Forschung e.V.

SMGP SSPM

Schweizerische Medizinische Gesellschaft für Phytotherapie
Société Suisse de Phytothérapie Médicale

PHYTOBIOTICA

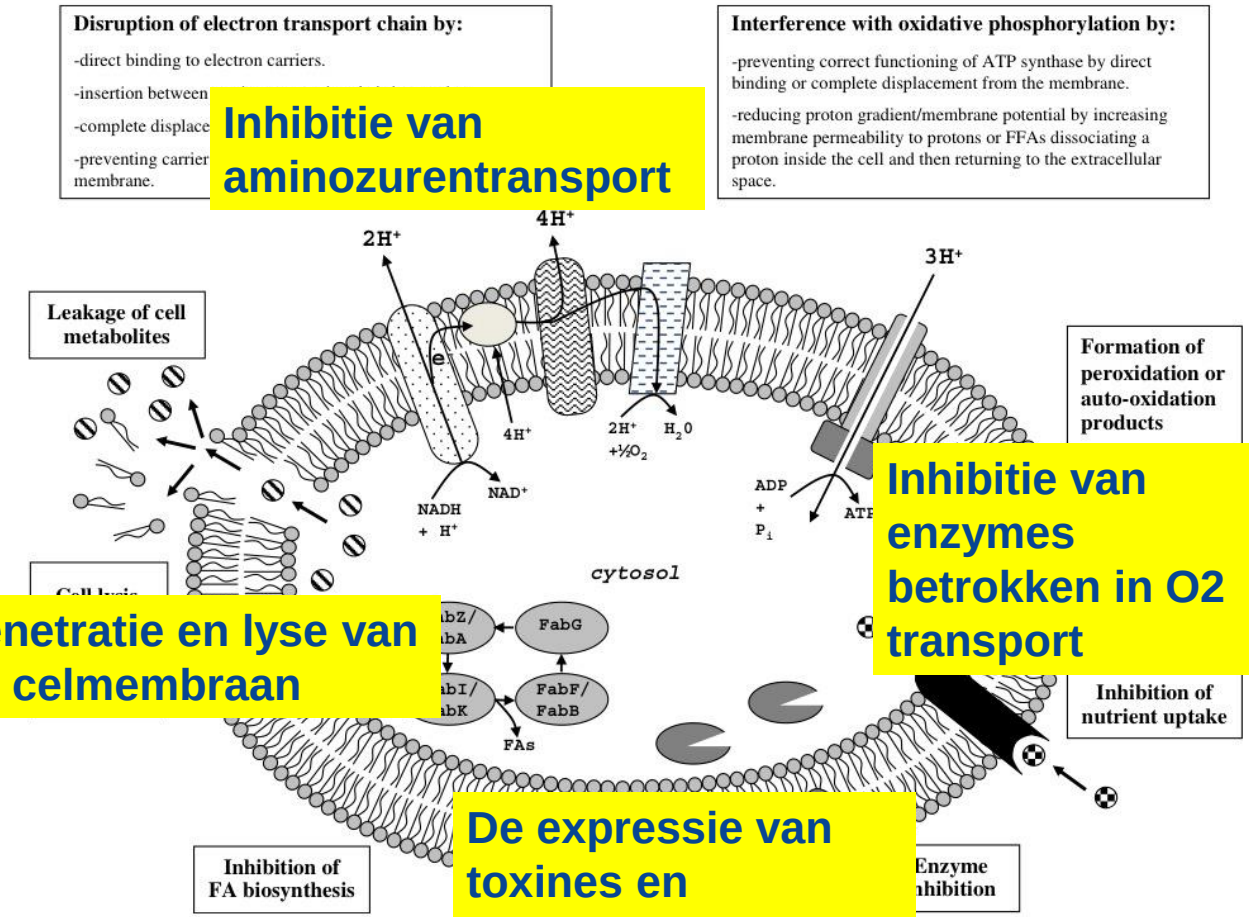
Hamamelis virginiana L.

- Traditional Phytomedicne
- Experience based
- Species niet gedifferentieerd

- Modern Aproach to Herbal remedies
- Evidence based
- Species gedifferentieerd


put it to the
TEST


Yes
No
Don't know



Inhibitie van aminozurentransport

Inhibitie van enzymes betrokken in O2 transport

Penetratie en lyse van de celmembraan

De expressie van toxines en virulentiefactoren wordt geblokkerd

Fig. 3 Schematic representation of possible cell … nisms of antibacterial action of free fatty acids … affect bacterial energy production by disrupting th… chain and/or interfering with oxidative phosphor… cause leakage of cell metabolites from the cell, complete cell lysis and autolysis. Membrane and cytosolic enzymes, including those required … be inhibited by FFAs. They can impair … directly on the transport protein or as … inability to produce ATP. Peroxidation … FFAs may also have deleterious effects on the bacterial cell and play a role in cell killing. For clarity, only the bacterial inner cell membrane is shown

Daavision LINTJESHOF GD

The effect of the application of mono-lauric acid with glycerol mono-laurate in weaned piglets, on the use of antimicrobials in sow herds.

De Steeck[1*], S., van der Wolf[2] P.J., Smart[3], P., Heyman[4], B., Ribarge[5], B.

1 Veterinary Practice Lingehof, Nederweert, The Netherlands, 2 Animal Health Service, Deventer, The Netherlands, 3 Daavision B.V., Elst, The Netherlands, * Corresponding author: s.steeck@lingehof.nl

Introduction

After years of an increasing use of antimicrobials in pig farms the Dutch government obliged the pig industry to reduce the use of antimicrobials by 10% in 2011 and by 50% by 2013. This obligation triggered the increasing interest in alternatives for antimicrobials such as mono-laurate. The Dutch firm Daavision B.V. produces a product called Duaflic which is a mixture of lauric acid and glycerol-mono-laurate. This product is used in a dose of 1 kilogram product per 1000 kilogram of compound feed in weaned piglets. Aim of the addition is to reduce the number of bacteria circulating among these weaned piglets, especially Streptococcus suis. As a result of a lower number of circulating bacteria fewer treatments with antimicrobials are necessary, resulting in a smaller number of Daily Doses per Animal Year (DDAY) per herd.

Material and methods

Veterinary Practice Lingehof has compiled a dataset where the DDAY (Daily Dose per Animal Year) of 11 case sow farms and 19 control sow farms was calculated. Case herds were those herds willing to use the product. Control herds were selected to resemble the case herds. The DDAY was calculated according to the guideline given by the Veterinary Pharmacy of the Faculty of Veterinary Medicine at Utrecht University as described in the MARAN report 2009. The DDAY has been calculated for the category sows during the period that Duaflic was being supplied and a similar period directly before the application of Duaflic. The period during which the supplement was added varied from 4 to 6 months.

Results

Table 1. Descriptive statistics of DDAY before and during use of Duaflic and delta-DDAY for case and control farms.

	N	Mean	Median	Minimum	Maximum	SD
Case farms						
DDAY before	11	1.1	1.1	0.6	1.8	0.4
DDAY after	11	0.8	0.7	0.5	1.4	0.3
Delta-DDAY	11	-0.3	-0.3	-0.8	0.1	0.3
Control farms						
DDAY before	19	1.3	1.2	0.9	2.0	0.3
DDAY after	19	1.3	1.2	0.8	2.0	0.3
Delta-DDAY	19	0.0	0.0	-0.3	0.3	0.2

Figure 1. Box and Whisker plot for the delta-DDAY for case ('yes') and control ('no') farms.

The Two sample Wilcoxon rank-sum (Mann-Whitney) test on delta-DDAY for case and control herds showed a significant difference (z=3.67, P=0.0002).

Discussion

The method of data-analysis in which antimicrobial use in the periods before and during the application of a certain product in case and control farms are being compared with one another, cannot be seen as an indication of the efficacy of the product. In the case design and the statistical analysis we did not correct for the many factors which might have an influence on the change of DDAY e.g. herd size. Also, the case design was not randomized and blind as a 'placebo effect' can not be ruled out in this study. Therefore a definite conclusion on the causality between the use of Duaflic and the improvement of the DDAY based on these data is not possible. However, these data show that the effect of Duaflic on the reduction of DDAY in the case herds can not be ruled out and that Duaflic might help in the reduction of the use of antimicrobials on sow farms.

Conclusion

The daily dose per animal year (DDAY) was reduced by approximately 8 days in the test sow herds. This is a significant difference from the control sow herds.

Recommendation

Randomized double blind studies are necessary to confirm these results.

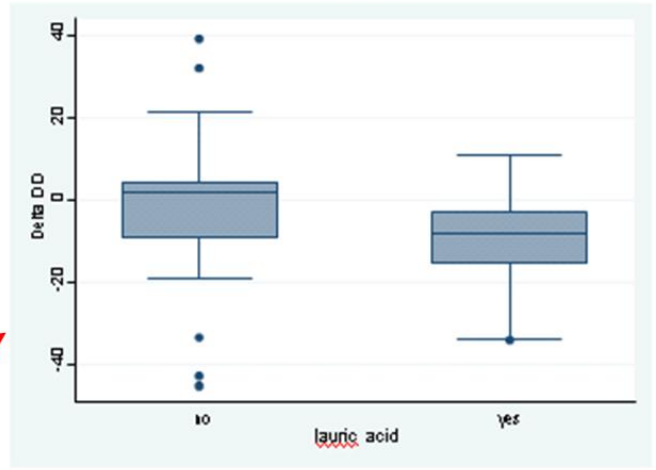


Figure 1. Box and Whisker plot for the delta-DD/AY for test ("yes") and control ("no") farms.

IPVS 2012 KOREA

SafePork 2011 Conference
19-22 June 2011
Maastricht, the Netherlands
9th International Conference on the Epidemiology and Control of biological, chemical and physical hazards in pigs and pork.

Put these dates in your calendar now!
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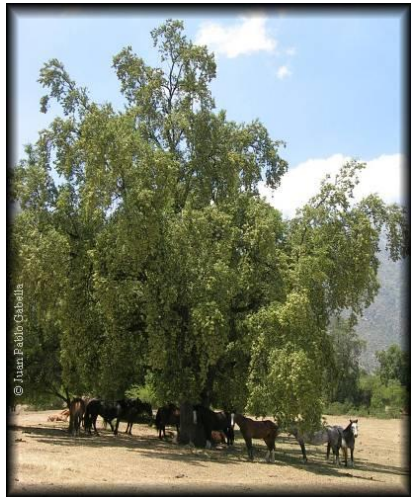
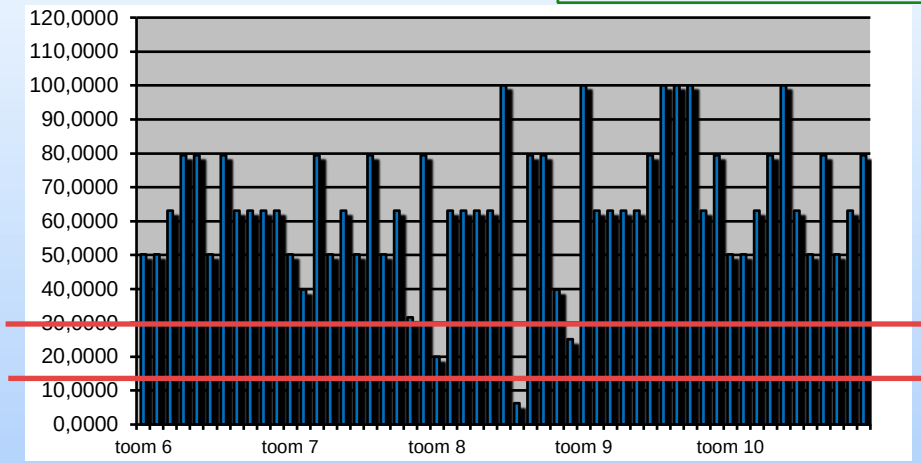
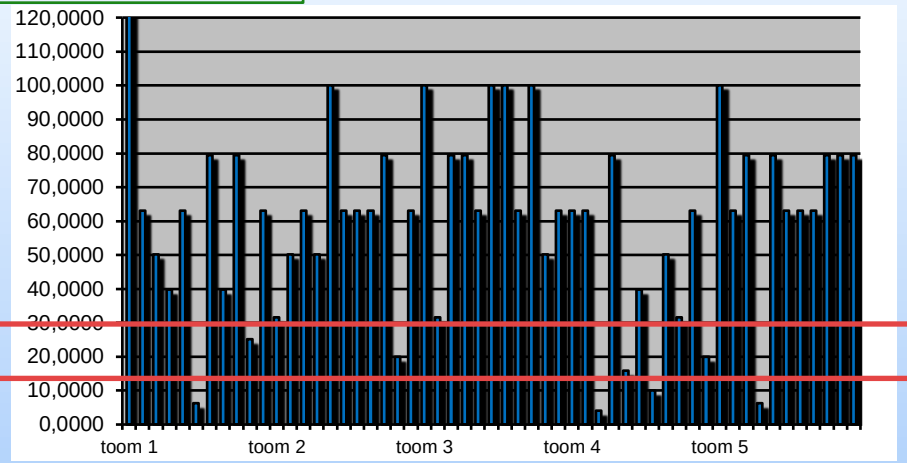


Quillaja saponnaria

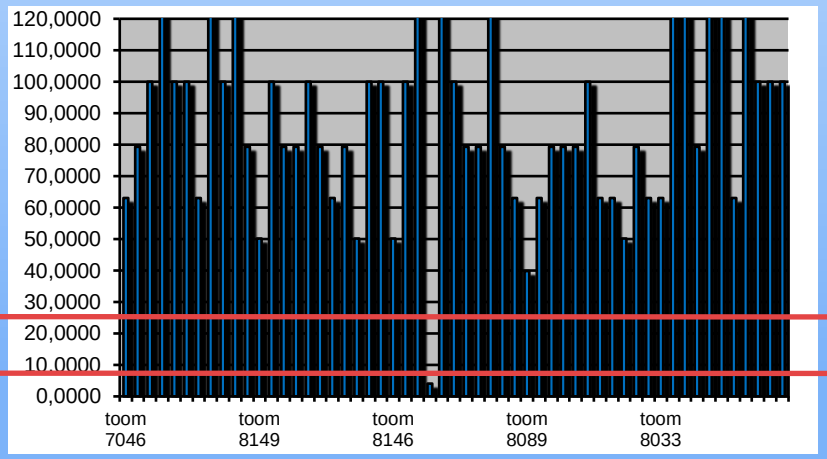
Yucca Shidigera

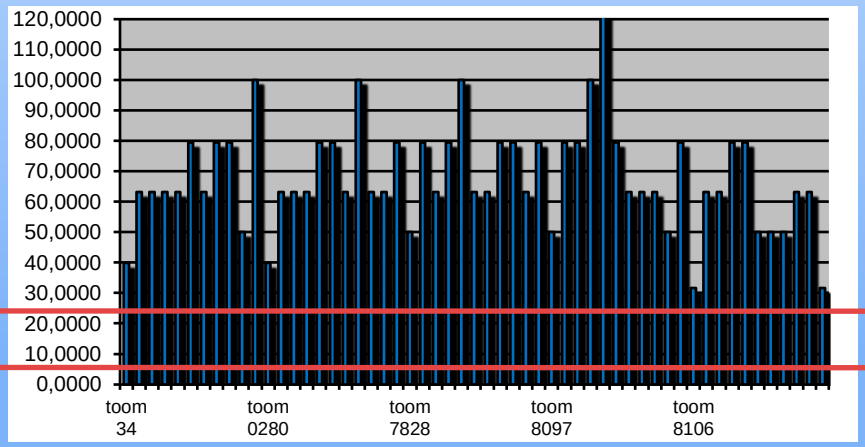
Control Ig G





Daafit Plus Immo Ig G





Daafit® Plus IMMO (Daafit® Plus and Saponins) in lacto feeds.

Phytobiologics: Novel Natural Compounds for Improving Enteric Health in Nursing Pigs

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REDUCING SCOUR IN COMMERCIAL PIG FARMS WITH A NOVEL PLANT EXTRACT— RESULTS OF VETERINARIAN FIELD TRIALS

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Doel : de inzet van een nieuw plantenextract evalueren reductie van het voorkomen van diarree bij biggen voor spenen

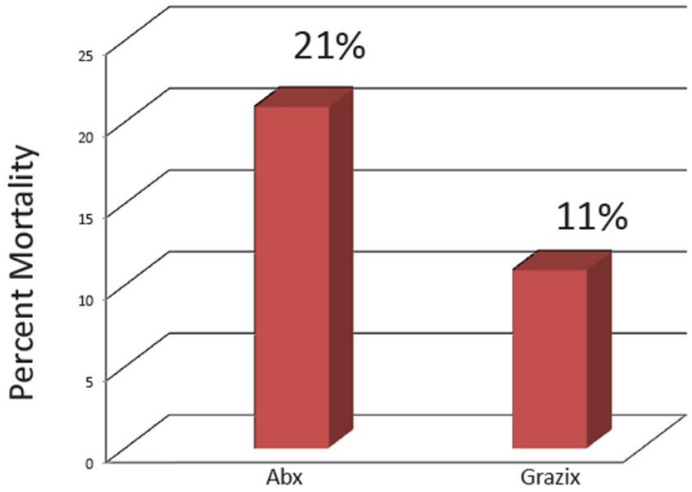


Figure 2. Percent mortality of piglets after administration of either antibiotics (N=21,717) or Grazix feed supplement (N=22,028). P<0.0001

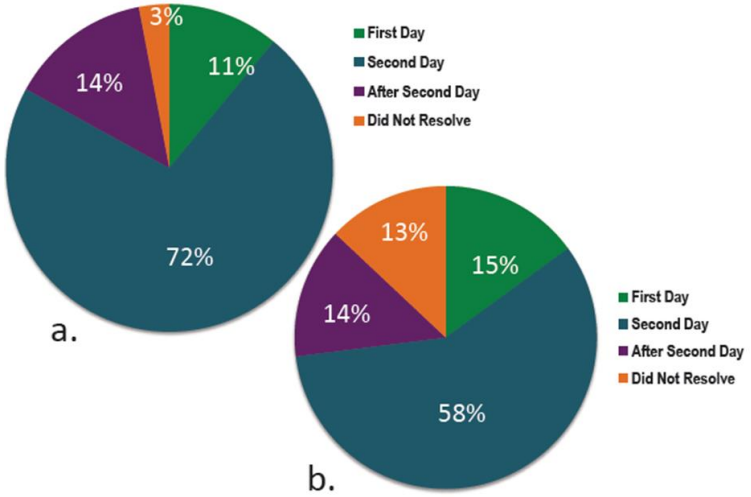
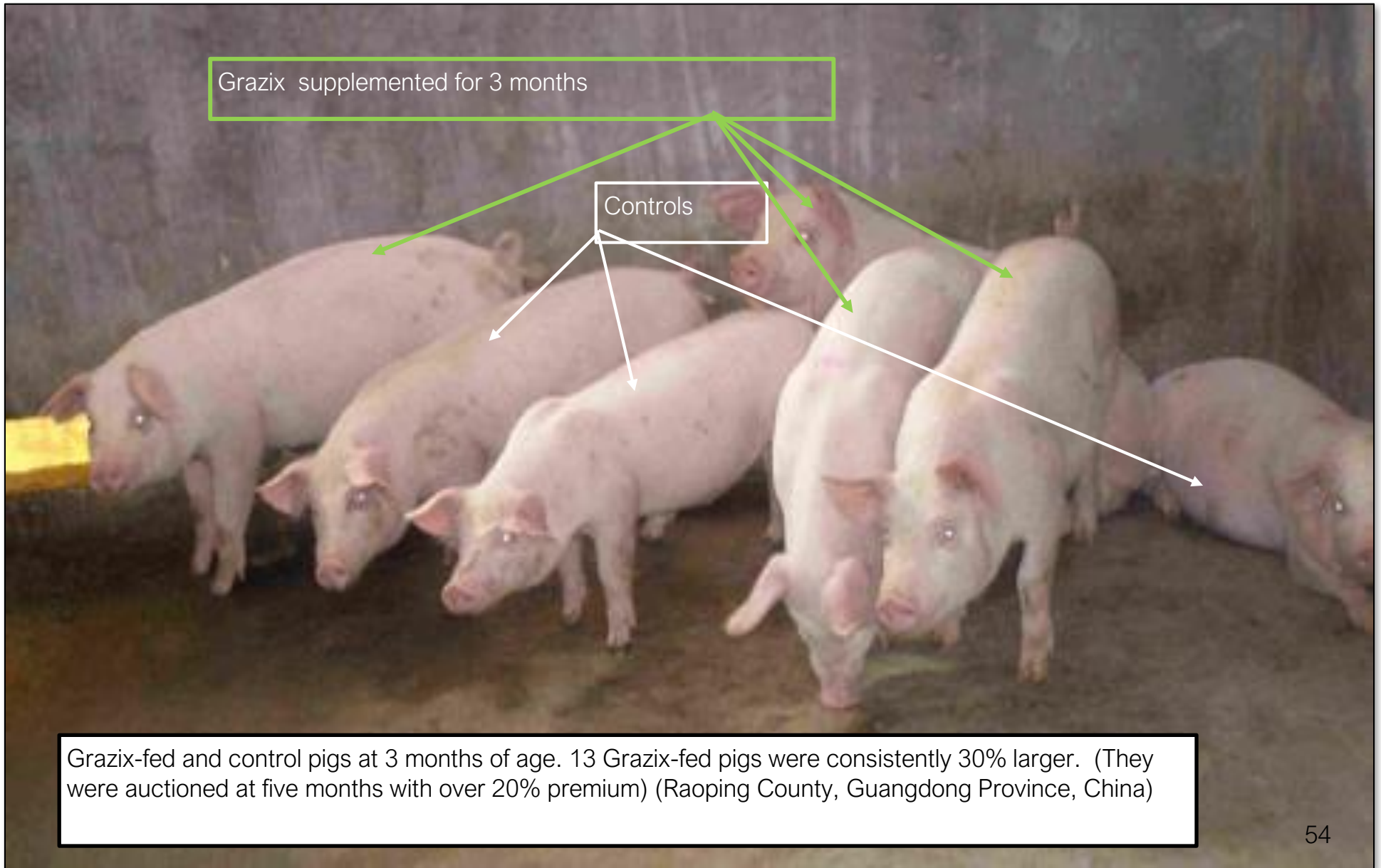


Figure 3. Percentage of piglets 1 to 8 days (a) and 9 to 21 days of age (b) in which scour resolved following consumption of Grazix feed supplement.

90 Days



Grazix-fed and control pigs at 3 months of age. 13 Grazix-fed pigs were consistently 30% larger. (They were auctioned at five months with over 20% premium) (Raoping County, Guangdong Province, China)

DON: Staartnecrose biggen

OTA: bloed in de urine

ZEA, DON: Spreidzitters

ZEA: roodkleuren en opzwellen spenen

ZEA:
Uitstulping van de baarmoeder

ZEA, DON: zwelling vulva, diarree en staartnecrose

DON, T-2: Lagere groei

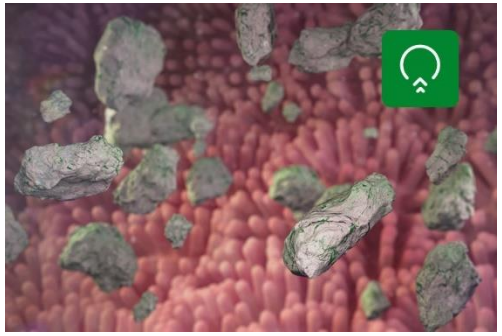
DON, T-2: huidbeschadigingen

DON: huidbeschadigingen

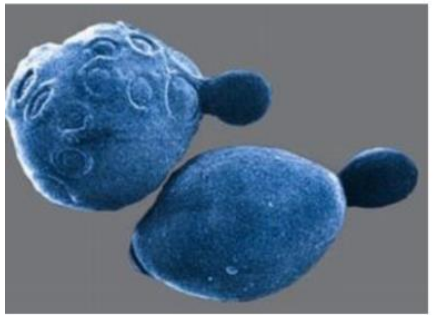
DON, T-2:
Beginnende staartnecrose

DON, T-2:
ontsteking van het oogvlies

Effecten van Mycotoxines



Adsorption



Yeast cel "Saccharomyces Cerevisiae"

Biotransformation

Mycotoxine Binders Next generation

Sylibum marianum

Bioprotection

Gynkio biloba

Never give up

Eubiotica onderhouden de microbiele biodiversiteit en hierdoor dragen ze bij tot gezonde populaties

VOOR HUN TOEKOMST

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