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MEMBER OF
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SVP Swine Veterinary Partners

La qualité de l'eau et son effet sur les grandes populations animals avec une emphase sur les porcs

CLÉ Beaurivage
21 janvier 2025
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ALARME

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VOS ANIMAUX SONT DES ATHLÈTES

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ILS DOIVENT ÊTRE TRAITÉS COMME DES ATHLÈTES EN PASSANT POURQUOI Y-A-T`IL AUTANT DE DIFFÉRENTS GATORADES POUR LES ATHLÈTES?

THE HYDRATION CONTINUUM

HYDRATION SOLUTIONS FOR EVERY OCCASION

	PROPEL® Electrolyte Water	GATORADE® G Zero	GATORADE FIT™	GATORADE G2® Lower Sugar	GATORADE Gatorlyte®	GATORADE® Thirst Quencher	GATORADE® Endurance Formula
	HYDRATION Lighter/Less Intense Activity (<60min)						HYDRATION + FUEL Higher Intensity/Longer Duration (>60min)
CARBS (G)*	0	0	2	8	8	21	22
CALORIES*	0	0	8	30	30	80	90
SODIUM (MG)*	160	160	163	160	294	160	310
POTASSIUM (MG)*	40	40	43	45	210	45	140
PURPOSE	• Ideal for shorter-duration training that is low-to-moderate in intensity • Consume with an alternate source of carbohydrate if using during longer-duration activity • Helps maintain fluid balance • Electrolytes to help replace what you sweat out	• Ideal for shorter-duration training that is low-to-moderate in intensity • Consume with an alternate source of carbohydrate if using during longer-duration activity • Helps maintain fluid balance • Electrolytes to help replace what you sweat out	• For the active consumer looking for healthy real hydration • Contains no added sugar, artificial flavors or sweeteners and no added colors • Delivers 100% of the daily value of vitamins A and C, as well as electrolytes from Watermelon and Sea Salt	• Ideal for shorter-duration, low/moderate-intensity training/competition • Electrolytes to help replace what you sweat out • Lower sugar option for athletes with high fluid needs	• Scientifically formulated for rapid rehydration and has a 5-electrolyte blend to help quickly replace fluids and electrolytes lost in sweat • Contains less sugar and no artificial sweeteners or flavors • Focused hydration when athletes get carbs from other sources	• Ideal for longer-duration, moderate/high-intensity training/competition • Carbs to fuel working muscles • Electrolytes to help replace what you sweat out	• Hydrates & fuels during longer-duration activity • Supports replacement of significant electrolyte loss that occurs during prolonged events (1.5-2+ hours) • Refuels with a 2:1 blend of glucose to fructose to reduce the risk of GI distress at higher intake levels

GTG / G2 / G ZERO: Gatorade products meet (2007) ACSM fluid replacement beverage guidelines for potassium (2-5 mEq/L), sodium (20-30 mEq/L).

G ENDURANCE FORMULA: The Gatorade Endurance Formula (EF) is designed to meet the additional electrolyte losses associated with endurance events and to support carbohydrate intake up to 90 g/h for events lasting >2.5 hours.

BACKED BY GSSI Gatorade Sports Science Institute

*12-oz serving size

6,6 x 215,9 mm

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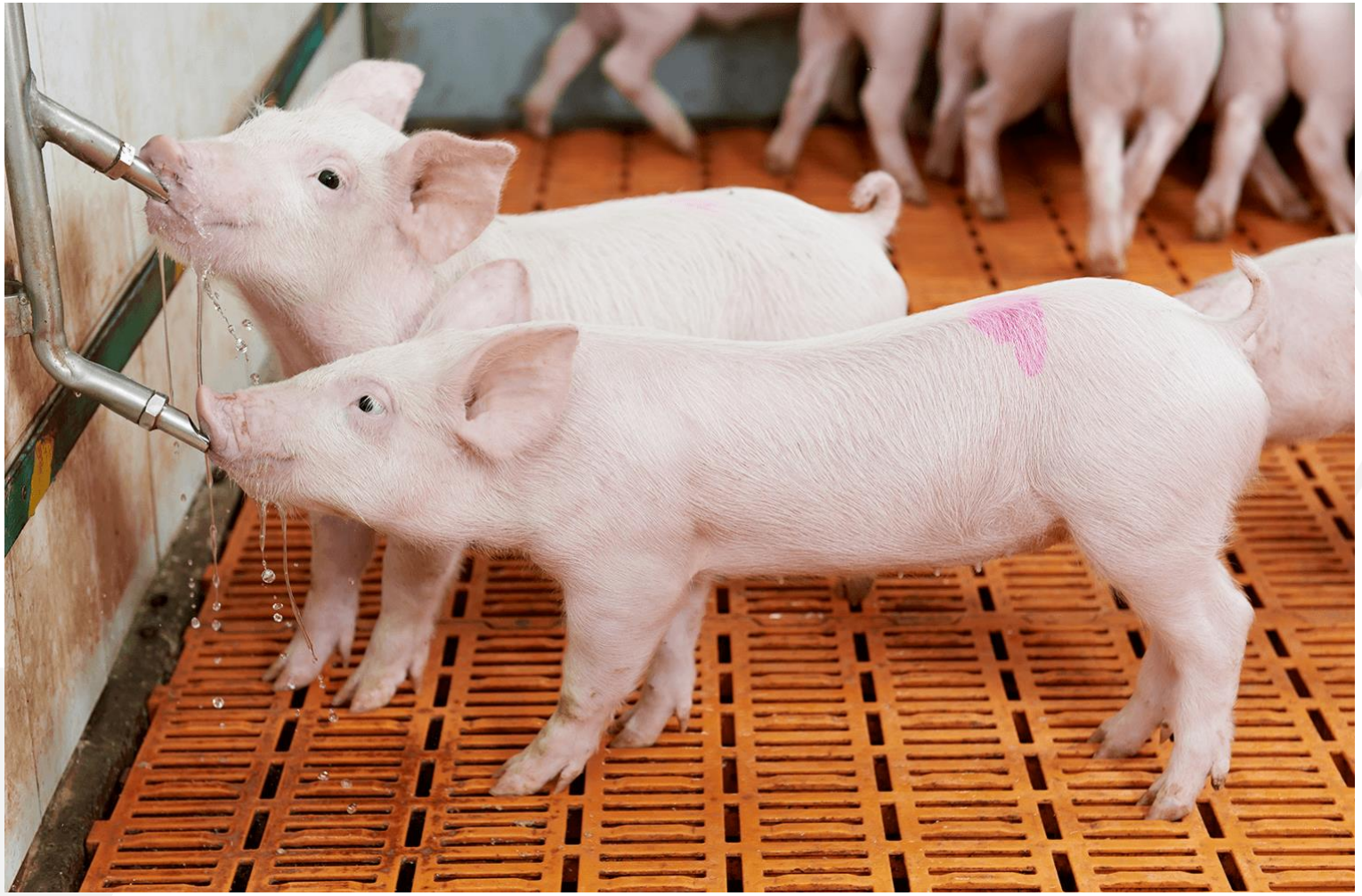
J'AIMERAIS QUE NOUS PUISSIONS REGARDER L'EAU COMME UN NUTRIMENT



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COMPARAISON DES PORC ET DES VOLAILLES

- Volaille
- Pourcentage d'eau vs poids corporel chez le poussin 90%
- Poulet adulte 60%
- Ratio Eau vs Aliment
  - 2:1 début
  - 1,7:1 croissance, finition
- Pour les reproducteurs en pré-ponte (restriction alimentaire) pas de relation entre l'aliment et l'eau

- Porc
- Pourcentage d'eau vs poids corporel chez le porcelet 80%
- Adulte (finition) 50%
- Ratio Eau vs Aliment
  - 2:1 pouponnière
  - 3:1 croissance, fintion
- En gestation (restriction alimentaire) pas de relation entre l'aliment et l'eau

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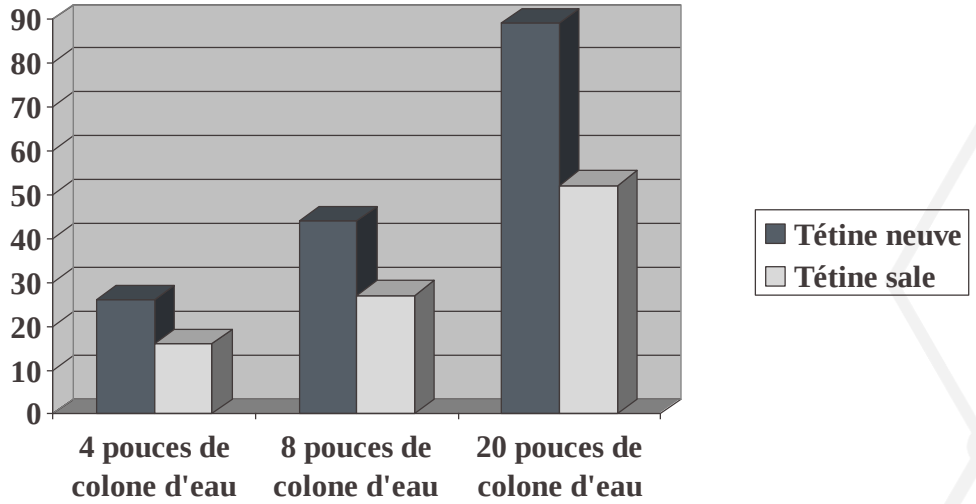
DÉBIT D'EAU

- Effect du biofilm ou de la saleté sur le débit d'eau des pipettese Technical letter ziggity



- Débit d'eau (tasses/min) (temps requis pour emplir une bouteille de 16 oz (sec)
  - Pouponnière 1-2 60-120
  - Croissance finition 2-4 30-60
  - Truies 4 30
- Ratio abreuvoir cochon 1 :25 Pouponnière, croissance, finition
- Général 1:12

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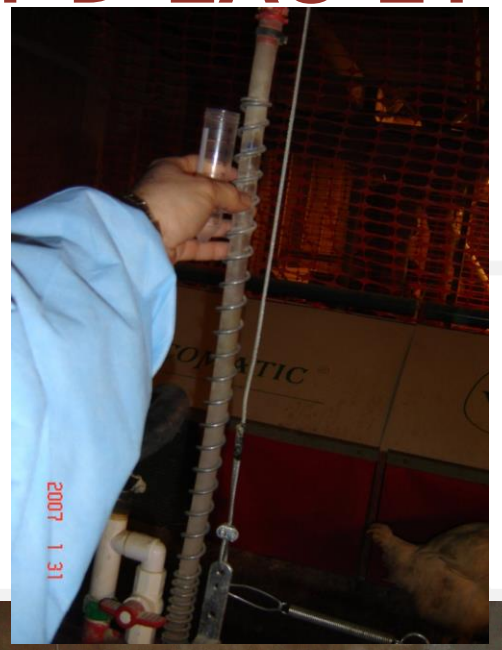
PRESSION D'EAU, DÉBIT D'EAU ET POIDS



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RÉPONSE DES POULETS À GRILLER VS LE DÉBIT D'EAU DES PIPETTES (POIDS EN G AND CONVERSION ALIMENTAIRE)

MILES ET AL 2004 J. APPL. POULT. RES. 13:258-262

Débit d'eau (mL/min)	Age (sem)					
	1	2	3	4	5	6
25	144	390	803	1344b	1916b	2465b
50	143	405	836	1398ab	2017a	2566a
75	143	401	839	1419a	2043a	2621a

Débit d'eau (mL/min)	Age (sem)					
	1	2	3	4	5	6
25		1.33	1.40	1.65	2.04	2.36
50		1.28	1.36	1.55	1.81	2.08
75		1.31	1.35	1.53	1.78	2.03

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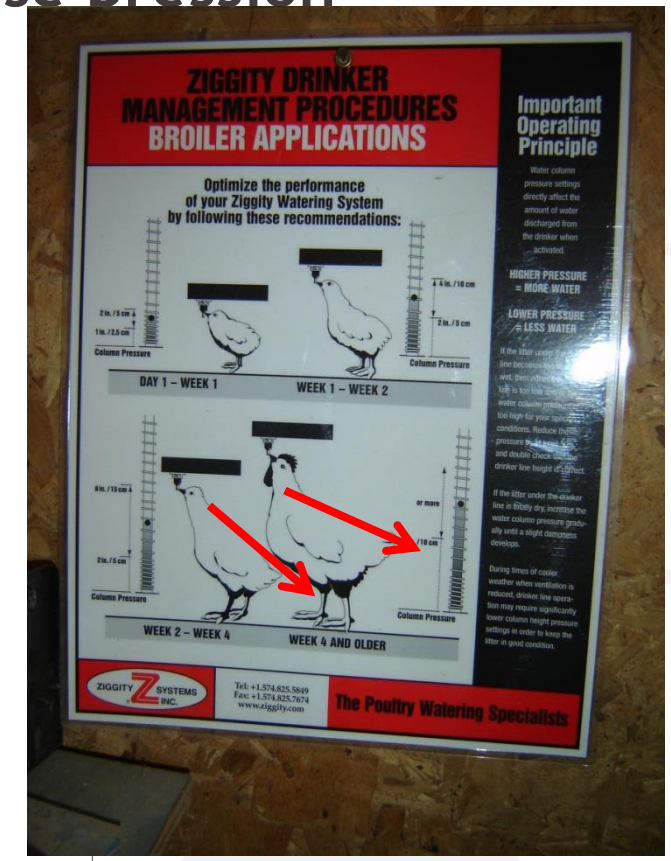
PRESSION D'EAU

Volaille basse pression



Porc haute pression

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TYPES D'ABREUVOIRS

- Pipettes ajusté en fonction de la hauteur (tétines)
- Coupes
- Cloches
- Nipples shoulder height
- Trémies

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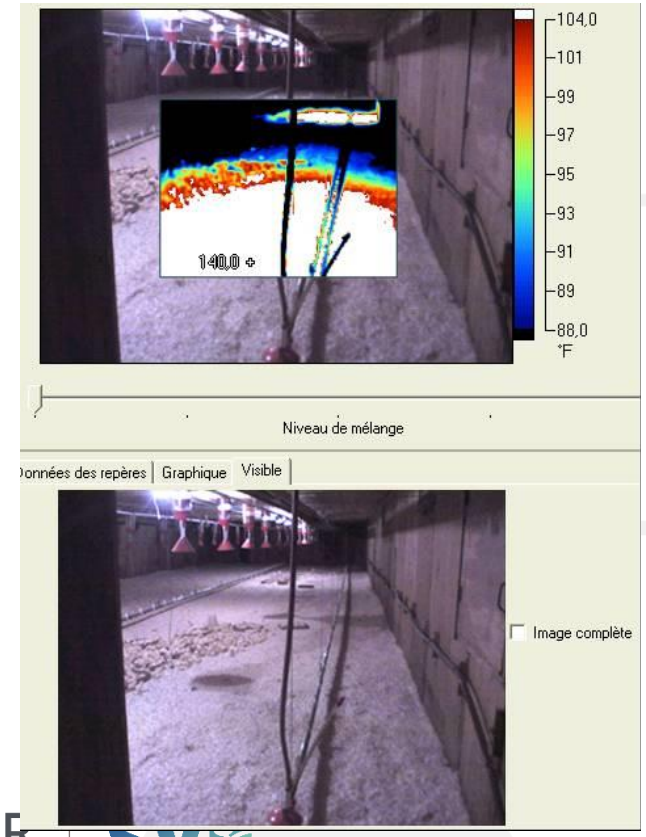
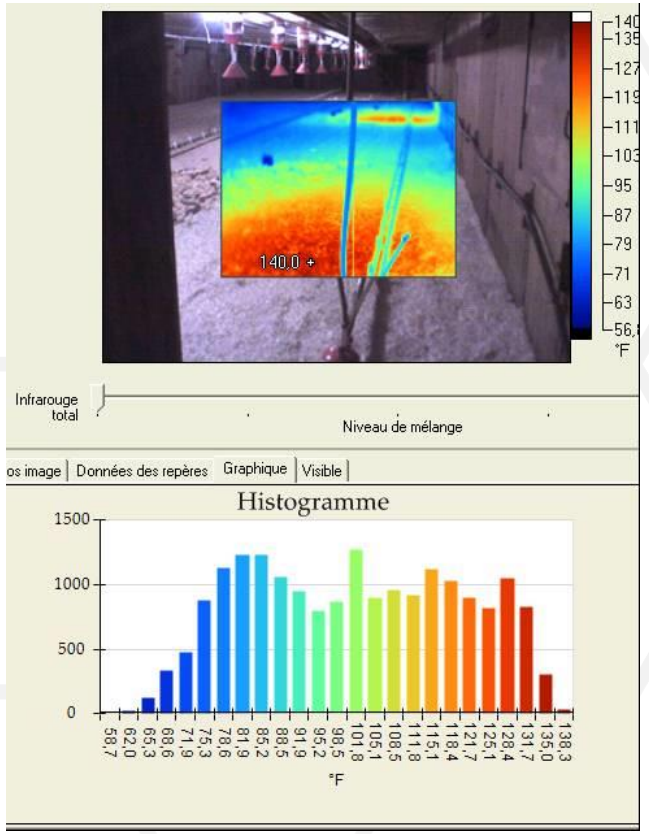
DEMANDEZ AUX OISEAUX

POULAILLER SANS PRÉCHAUFFAGE ZONE DE CONFORT ÉTROITE AVEC SEULEMENT 3 PIPETTES DANS LA ZONE DE CONFORT





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MÉDICAMENTATION PAR L'EAU CONSOMMATION NORMALE ET VARIATION PAR LA TEMPÉRATURE DE LA PIÈCE

Pig health

Read this article in: Language

Water medication: Normal consumption and possible variables based on room temperature

We must know the environmental conditions to be able to correctly estimate water consumption.

E. Marco

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29 June 2023

Graph 4. Influence of the water flow and room temperature on the performance of pigs at 10-14 weeks old. Nienaber and Hahn,1984.

	Room temperature			
	4.5°C		35°C	
Water flow (ml/min)	100	1100	100	1100
Water consumption (L/day)	3.26	4.62	3.13	10.83
Feed consumption (Kg/day)	2.24	2.18	0.74	1.09
Average Daily Gain (g)	855	730	278	466
Feed conversion	2.62	2.99	2.66	2.34
Time dedicated to drinking (min./day)	32.6	4.2	31.3	9.9

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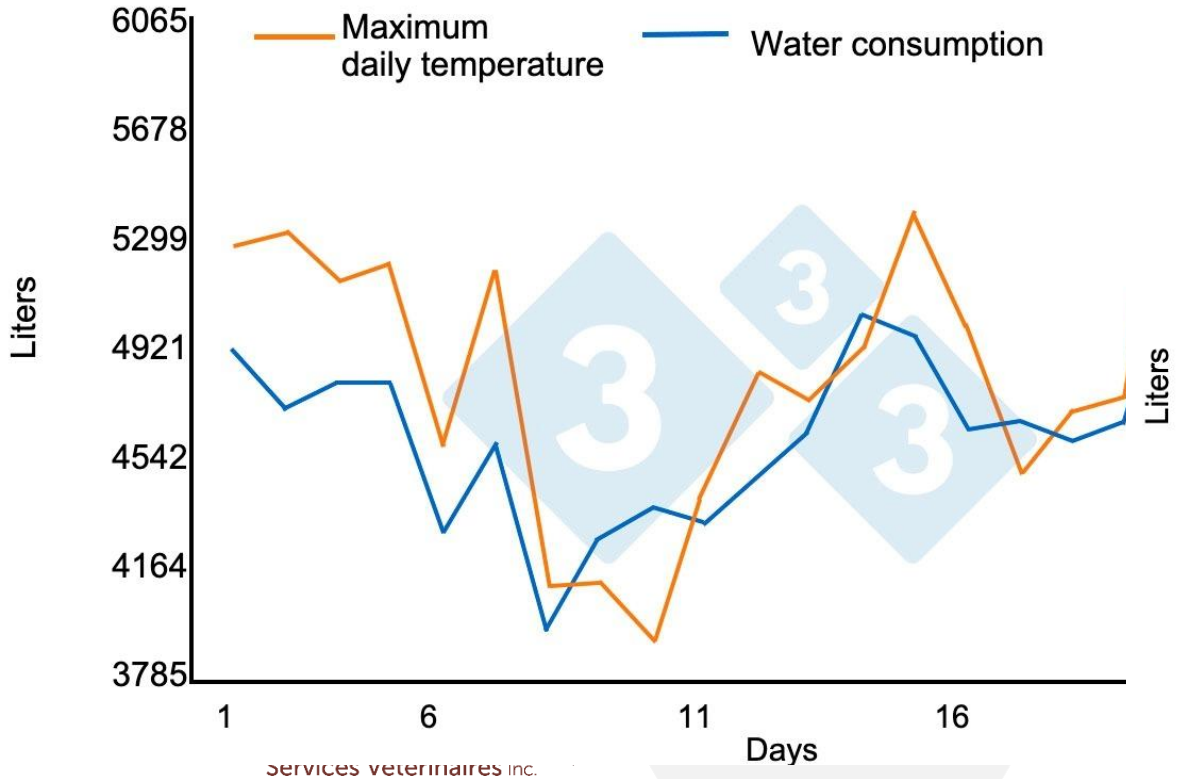
TYPES DE PUITS ET INFILTRATION

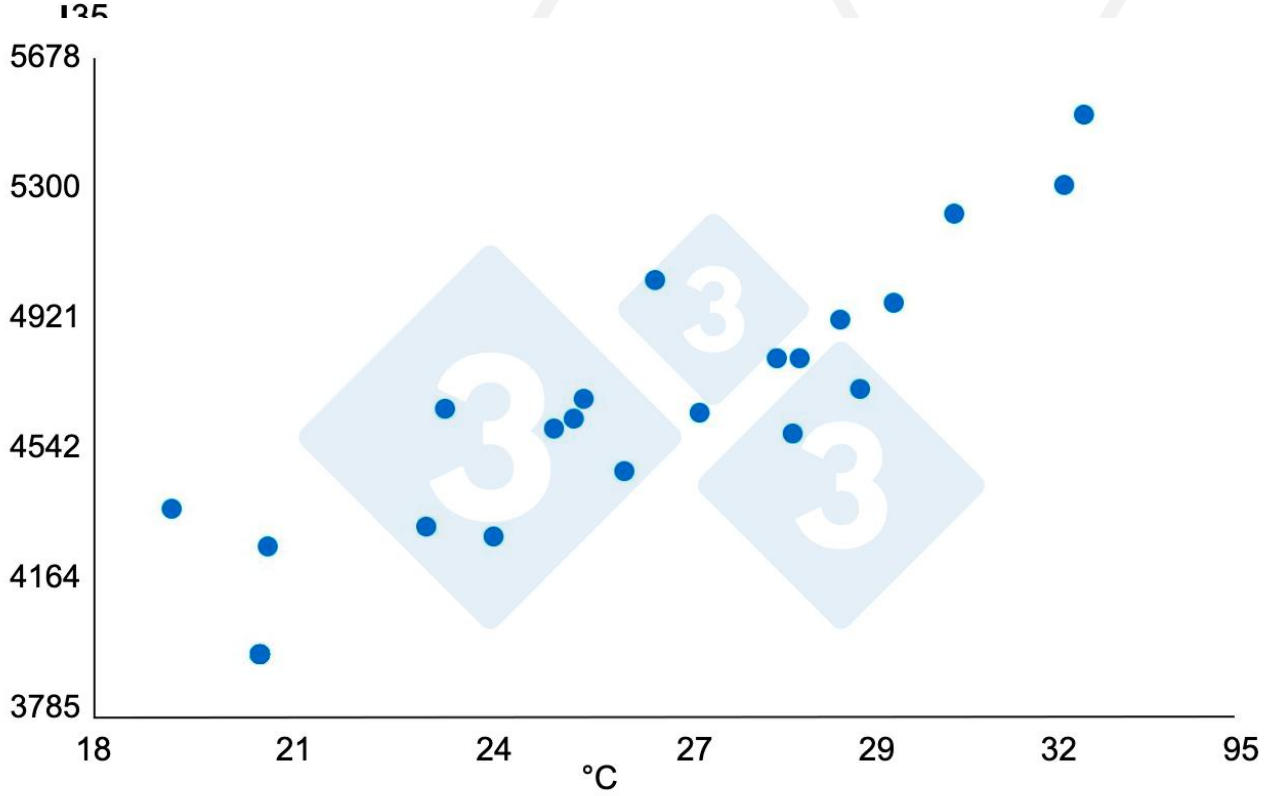
MÉDICAMENTATION PAR L'EAU CONSOMMATION NORMALE ET VARIATION PAR LA TEMPÉRATURE DE LA

Pig health

Read this article in: Language

Water medication: Normal consumption and possible variables based on room temperature





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QUALITÉ D'EAU

- Physico-chimique
- Sulfate (laxatif) (litière humide)
- Balance électrolytique
- Acides
  - Organiques
  - Non organiques
    - Phosphorique
    - Chlorhydrique
- Nitrates 25 ppm (préférence pour l'analyse bactériologique)
- Nitrites devraient être testés sur la ferme

- Physico-chimique (Patience,2012)
- Sulfate (laxatif) (diarrhée)

max 1000ppm NRC 2012

Nitrates et nitrites

Nitrates 100ppm NRC 2012

Nitrites ?

Solides dissous totaux (TDS) max 3000 ppm NRC 2012

Dureté Douce < 60ppm

Dure >120ppm NRC 2012

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ÊTES-VOUS DÉJÀ ALLER AU COLORADO EN PARTCULIER À MANITOU SPRINGS?

Manitou Springs' Mineral Content

Mineral Springs Foundation

Mineral		7 Minute	Shoshone	Wheeler	Navajo	Cheyenne	Stratton	Twin	Iron Geyser
Alkalinity (bicarbonate)	$CaCO_3$	573 mg/L	2,040 mg/L	1,930 mg/L	2,317 mg/L*	2,010 mg/L	1,951 mg/L*	1,020 mg/L	1,320 mg/L
Calcium	Ca	155 mg/L	449 mg/L	420 mg/L	420 mg/L*	437 mg/L	370 mg/L*	252 mg/L	173 mg/L
Chloride	Cl	46.1 mg/L	263 mg/L	241 mg/L	230 mg/L*	243 mg/L	180 mg/L*	76.2 mg/L	212 mg/L
Copper	Cu	-	0.12 mg/L	0.17 mg/L	0.07 mg/L	0.08 mg/L	0.05 mg/L	-	-
Fluoride	F	1.0 mg/L	4.0 mg/L	3.4 mg/L	3.10 mg/L*	3.40 mg/L	3.20 mg/L*	2.40 mg/L	4.80 mg/L
Iron	Fe	0.54 mg/L	-	0.11 mg/L	-	-	-	-	14 mg/L
Lithium	Li	.079 mg/L	.759 mg/L	.726 mg/L	.705 mg/L*	.671 mg/L	.568 mg/L*	.188 mg/L	.753 mg/L
Magnesium	Mg	53.2 mg/L	75.7 mg/L	82.4 mg/L	82 mg/L*	76.3 mg/L	68 mg/L*	77.2 mg/L	26.1 mg/L
Manganese	Mn	-	2.39 mg/L	1.33 mg/L	0.78 mg/L*	1.25 mg/L	0.42 mg/L*	-	0.77 mg/L
Potassium	K	8.38 mg/L	76.5 mg/L	70.5 mg/L	70 mg/L*	67.8 mg/L	50 mg/L*	18 mg/L	79.9 mg/L
Silica	SIO	12.2 mg/L	46.4 mg/L	38.7 mg/L	41 mg/L*	40.9 mg/L	34 mg/L*	15.4 mg/L	82.4 mg/L
Sodium	Na	55.1 mg/L	499 mg/L	483 mg/L	430 mg/L*	445 mg/L	360 mg/L*	129 mg/L	508 mg/L
Sulfate	S04	71.9 mg/L	219 mg/L	207 mg/L	190 mg/L*	205 mg/L	160 mg/L*	72.8 mg/L	239 mg/L
Zinc	Zn	.13 mg/L	.11 mg/L	.096 mg/L	.094 mg/L*	.105 mg/L	.072 mg/L*	.080 mg/L	.062 mg/L
Total Dissolved Solids	TDS	1,100 mg/L†	2,870 mg/L†	2,470 mg/L†	2,690 mg/L*	2,500 mg/L†	2,200 mg/L*	1,300 mg/L†	2,060 mg/L†

mg/L – milligrams per liter

Indicates highest amount of content

Indicates lowest amount of content

$CaCO_3$,Ca, Cl, F, Li, Mg, K, SIO, Na, S04, Zn Analysis: SGS North America, Inc., Wheat Ridge, CO 2018
Fe, Mn Analysis: Hall Environmental Analysis Laboratory, Inc., Albuquerque, NM 2009 / 2010.
Cu Analysis: ACZ Laboratories, Inc., Steamboat Springs, CO 2008
*Analysis from: Hall Environmental Analysis Laboratory , Inc. report 2009 / 2010
†Analysis from: SGS North America, Inc., Wheat Ridge, CO report 2020

For more information: www.manitoumineralsprings.org

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COMPOSITION MINÉRALE ET EFFET SUR LA SANTÉ?

CALCIUM (Ca):
Calcium is the mineral the body uses most
About 99% of the body is calcium contained in bones, teeth. Phosphorus and vitamin D are important for the proper use of calcium by the body. Calcium regulates the rhythm of the heartbeat. Your heart could not beat without it. Calcium is necessary for bone and tooth formation, heart function, blood coagulation and muscle contraction. Calcium has a role in controlling blood pressure and may help prevent colorectal cancer, high blood pressure, heart disease, PMS and osteoporosis. Leg cramps may be alleviated with calcium. Children with extreme calcium deficiency may develop rickets; a disease that causes deformed bones. Too much magnesium or phosphorus in the diet may lead to a calcium deficiency, as can excessive smoking, alcohol or consumption of soft drinks.

CHLORIDE (CL):
In tandem with potassium and sodium, chloride is an electrolyte that helps to keep the fluid balance in and out of the body's cells. Regulates fluid and acid-based balance, plus forms part of gastric juice necessary for digestion. It is necessary for the proper functioning of the liver and for healthy joints and tendons.

COPPER (Cu):
Copper, found in the bones, muscles, brain, heart, liver and kidneys, is an important trace mineral for the cardiovascular, nervous and skeletal systems. Copper pipes and cooking pans may raise the copper content of food and water. Highly processed foods are often depleted of most of their copper content. Copper is involved in the absorption and metabolism of iron. It also helps form connective tissue, nerve fibers and red blood cells. Copper helps keep your arteries flexible. Severe copper deficiency is rare. Too much zinc, or excessive diarrhea may lead to a marginal deficiency with symptoms such as anemia, skeletal defects, loss of pigment in hair and skin, decreased resistance to infection, heart disease, high cholesterol, nervous system disorders, lack of coordination and a tingling of the extremities.

FLUORIDE (F):
Fluoride is found mainly in the teeth - no wonder it is such a common ingredient in toothpastes. In many parts of the world, fluoride is added to tap water. Studies have proven that this significantly decreases tooth decay in children, especially when fluoride is consumed before the teeth erupt. Fluoride is essential for healthy bone and tooth formation, as it helps the body retain calcium. It prevents acid and plaque formation in the mouth caused from food, especially sugar.

IRON (Fe):
You can tell iron is an important nutrient by the amount of supermarket products that are advertised as 'iron enriched'. Unfortunately, many of these products are enriched from ferrous, not ferric, compounds, which is more difficult for the body to absorb. Iron is found in many plants, but even that is often in a form that is difficult to absorb (some iron-rich vegetables like spinach also contain oxalic acid, which interferes with the absorption of iron and other minerals). Vitamin C greatly improves iron absorption. Iron binds with hemoglobin molecules and carries oxygen in your blood and throughout your body. It is involved in enzyme activities related to energy storage and availability. Iron also forms part of several enzymes and proteins in the body. Iron deficiency can lead to anemia, which causes lethargy, poor concentration, pale skin and shortness of breath. Vegetarians have to ensure they get an adequate iron intake, as do menstruating or pregnant women.

LITHIUM (Li):
Lithium carbonate (Li2CO3) has been used since the 1960's for treatment of those who suffer from the psychological disorder of manic depression or bipolar affective disorder.

MAGNESIUM (Mg):
More than half of the body's magnesium is found in bone, the rest in cells, soft tissues, muscle and blood. If the diet is low in magnesium, it is leached from the bones. Cooking, canning and freezing destroy magnesium. Magnesium is involved in the formation of bone and teeth. It is also vital for nerve conduction and muscle contraction, plus activates enzymes that aid in the release of energy from food. It helps control blood pressure, regulate body temperature and maintain the acid-base balance in the body. Calcium and magnesium must be in proper proportion to perform their closely related body functions. For example, calcium stimulates muscles while magnesium relaxes them. Magnesium has had some success in treating migraines, asthma and diabetes.

MANGANESE (Mn):
Not a lot is known about this trace element, but it may play a role in treating heart arrhythmia, osteoporosis, epilepsy and back pain. Our bodies store about 10 mg of manganese in the bones, liver, kidneys and pancreas. Manganese is used in bone formation, muscle coordination, nervous system function and is involved in several enzyme reactions. It is also used, along with Vitamin K to promote blood clotting.

POTASSIUM (K):
Potassium is a major nutrient in fruits and vegetables and is the predominant positive electrolyte in body cells. To avoid high blood pressure, try to keep your potassium to sodium intake at 5:1 ratio.
Potassium helps maintain blood pressure, and is involved in nerve transmission and muscle contraction. In partnership with chloride, potassium helps maintain the water balance in and out of body cells, plus it regulates blood pressure and heartbeat. It stimulates the kidneys to release toxins from the body. Some studies have shown potassium may help prevent strokes. Potassium deficiency is common due to the modern diet's high salt consumption, which stimulates the body to rid itself of the mineral. Symptoms include muscle cramps, poor reflexes, heart irregularities, low blood pressure, respiratory failure, kidney problems, insomnia and dry skin

SILICA (SIO):
No apparent health benefits

SODIUM (Na):
Sodium is one mineral you don't need to worry about getting enough of. The typical modern diet has more than enough in the form of sodium chloride - otherwise known a table salt - found in processed foods, cured meats, canned vegetables, salty snacks and condiments. Sodium is an electrolyte that plays a crucial role in maintaining blood pressure. Along with potassium and chloride, it regulates fluids and acid-base balance in the body. It is also involved in nerve transmission and muscle contraction, including the heartbeat. Sodium excess is a more likely scenario, but profound sweating, fever, diarrhea, fasting and very low-salt diets can result in symptoms like muscle twitching, dehydration, memory loss, nausea, poor concentration and loss of appetite.

SULFATE (S04):
No apparent health benefits

ZINC (Zn):
Zinc is an important trace element involved in antioxidant reactions. It can boost your immune system and has been reported to be effective in fending off bad colds. Vegetarians should be conscious of ensuring an adequate intake of zinc. Zinc is a component of insulin and over 100 enzymes, proteins, nucleic acids and hormones. It helps in the healing of wounds, tissue repair, growth, energy conversion and sexual development. It regulates blood sugar, blood pressure, heart rate and cholesterol levels.

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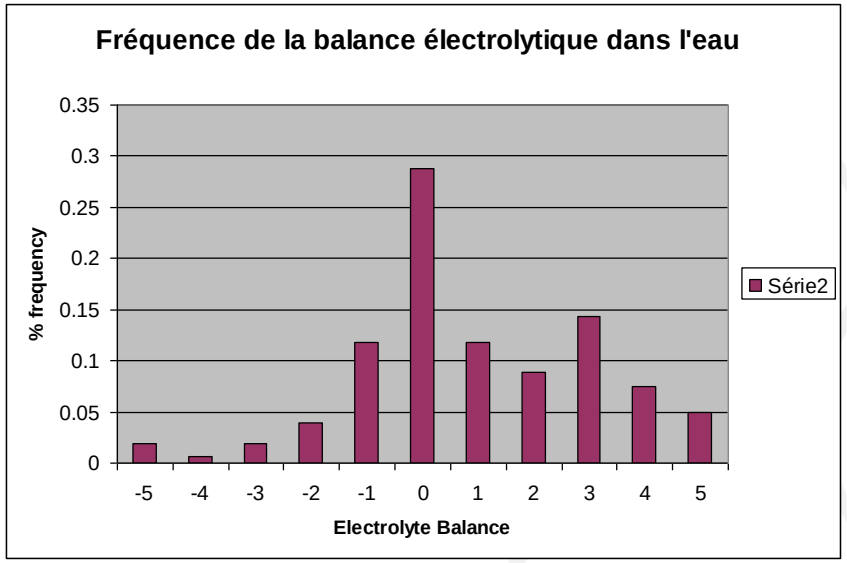
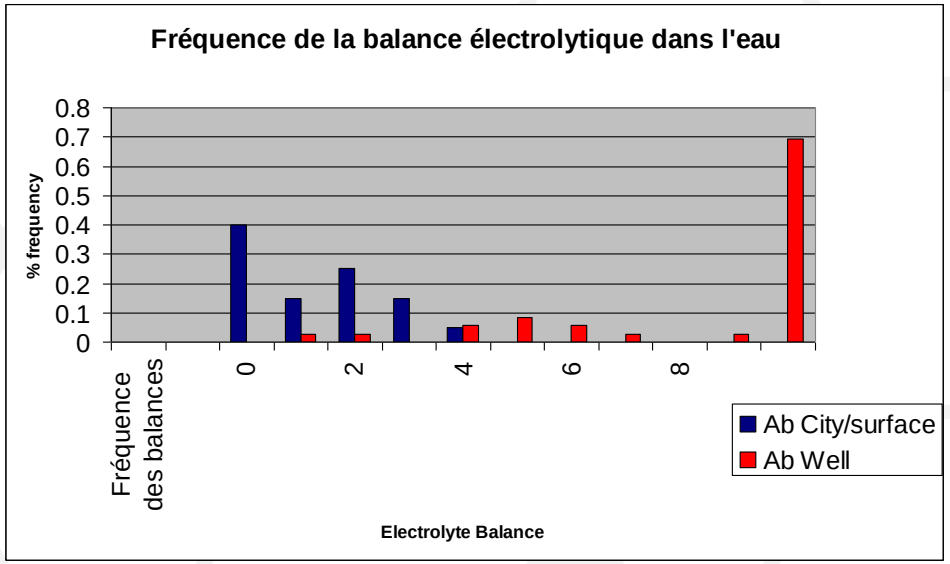
DIFFÉRENCES RÉGIONNALES EN BALANCE ÉLECTROLYTIQUE

Fréquence de la balance électrolytique dans des eaux au Québec (n=306)



Fréquence de la balance élecrolytique de l'eau dans des eaux de surface et des eaux de ouit en Alberta



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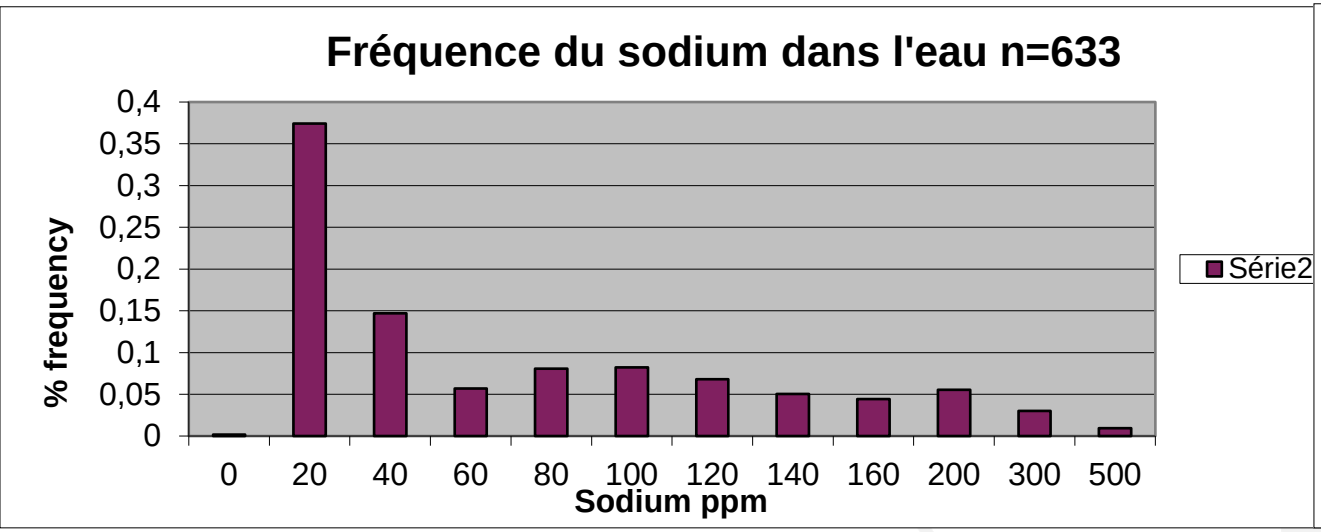
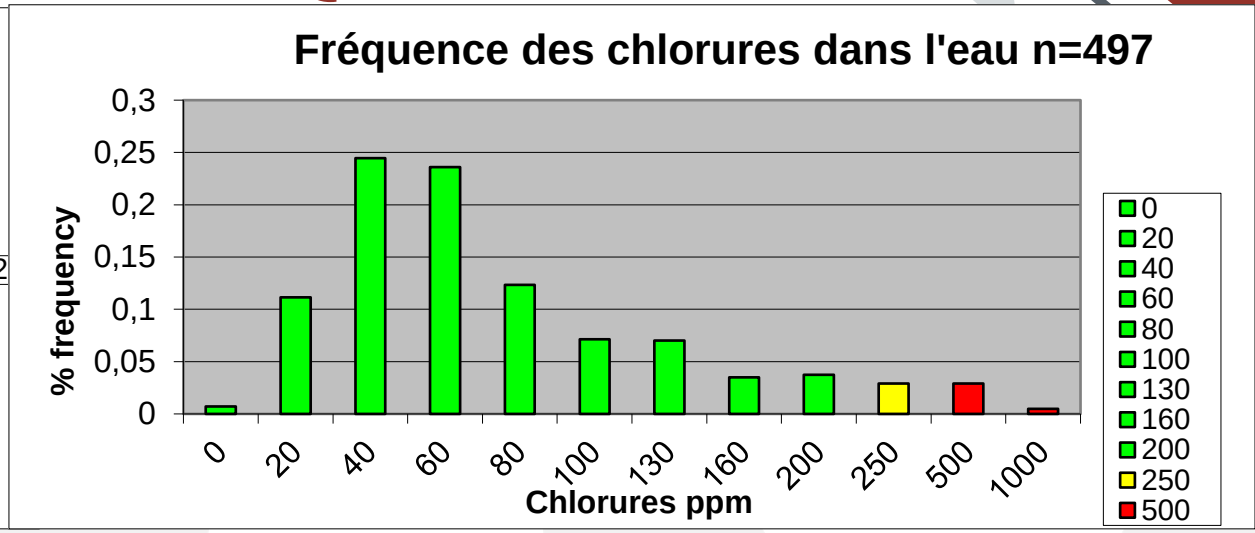
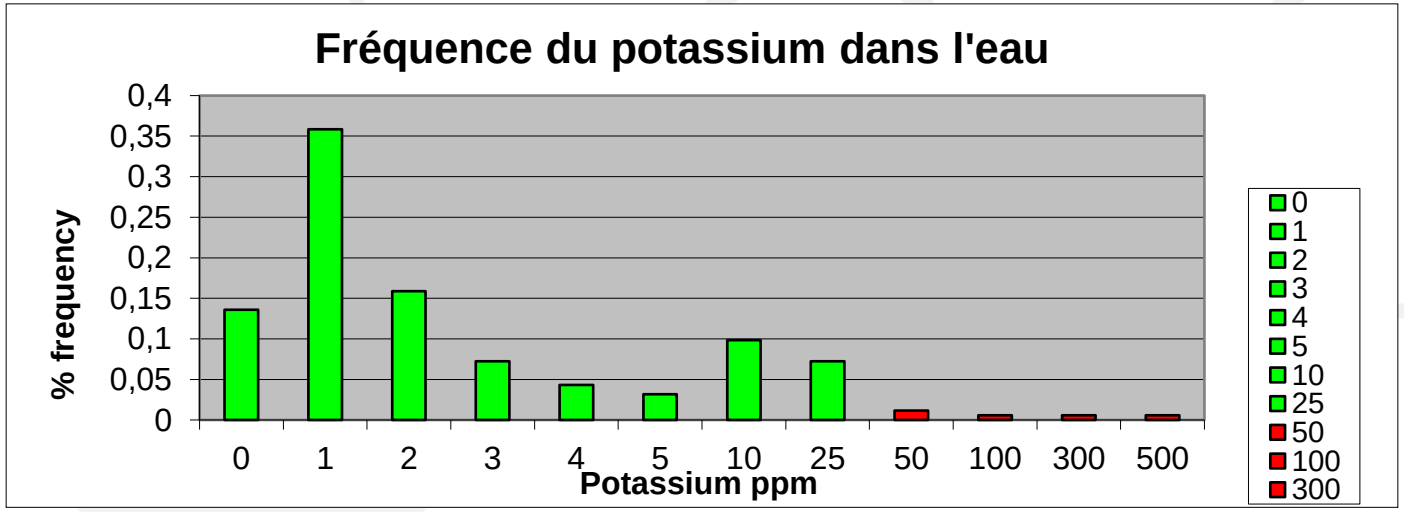
FRÉQUENCE DES IONS FORTS DANS 633 EAUX PRINCIPALEMENT DU QUÉBEC







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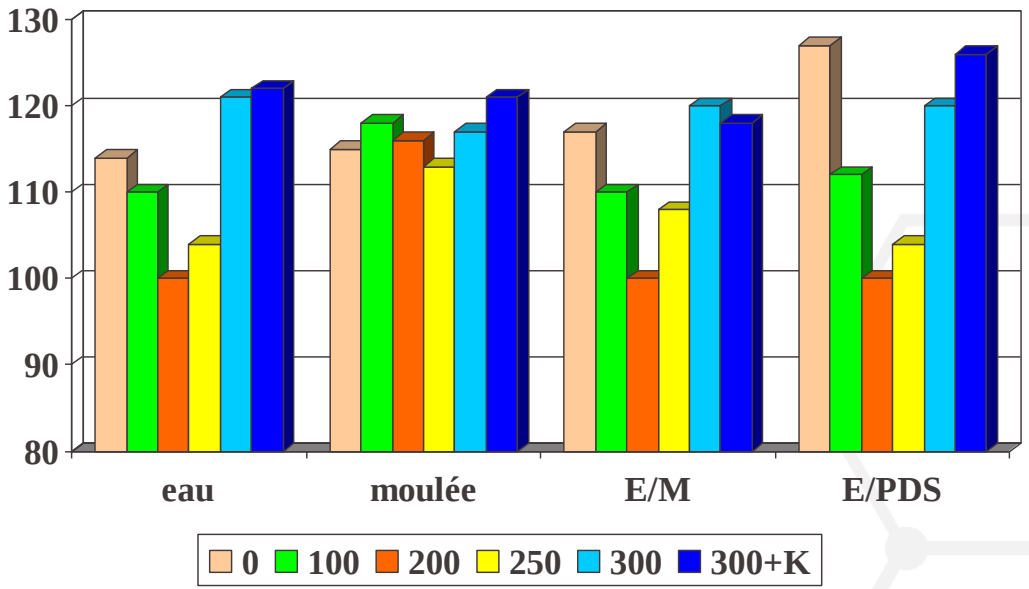
EFFET DE LA COMPOSITION DE LA DIÈTE EN IONS FORTS

EFFET DE LA BALANCE ÉLECTROLYTIQUE SUR LA CONSUMMATION D'EAU

ADAPTÉ DE GHISLAINE ROCH AVIA CONFERENCE, AVIA WEB SITE



- La consommation d'eau est plus grande quand la composition de l'aliment afin d'éliminer les excès de cation ou d'anions. (Shaw et al. 2006)

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EFFET D'UN TRAITEMENT D'OSMOSE INVERSÉE

Avant osmose

Nutrient	Result
Calcium	30
Phosphate	NM
Sodium	28
Chlorures	51,6
Potassium	NM
Dureté	108
pH	7,88
Alcalinité	120
Fer	48
Sulfates	16
Magnésium	8
SDT	235
Manganèse	NM
Cuivre	NM
Zinc	NM

Après osmose

Nutrient	Result
Calcium	0
Phosphate	NM
Sodium	1
Chlorures	32
Potassium	NM
Dureté	0
pH	8,15
Alcalinité	30
Fer	5
Sulfates	3,53
Magnésium	0
SDT	65
Manganèse	NM
Cuivre	NM
Zinc	NM

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EFFET OF D'UN TRAITEMENT DE L'EAU AVEC UN ADOUCISSEUR

Avant adoucisseur

Nutriment	Résultat
Calcium	60,71
Phosphates	NM
Sodium	37,61
Chlorures	35,4
Potassium	NM
Dureté	172,02
pH	7,87
Alcalinité	100
Fer	84,9
Sulfates	106
Magnésium	2
SDT	341
Manganèse	NM
Cuivre	NM
Zinc	NM

Après adoucisseur

Nutriment	Résultat
Calcium	0,1
Phosphates	NM
Sodium	98,6
Chlorures	42,5
Potassium	NM
Dureté	0,66
pH	8
Alcalinité	90
Fer	101,8
Sulfates	85
Magnésium	0,1
SDT	316
Manganèse	NM
Cuivre	NM
Zinc	NM

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EFFET D'UN TRAITEMENT D'ASSAINISSEUR D'IODE DANS L'EAU

Avant iode

Nutriment	Résultat
Calcium	13
Phosphate	0
Sodium	134
Chlorures	129
Potassium	NM
Dureté	40
pH	7,2
Alcalinité	131
Fer	52
Sulfates	93,5
Magnésium	2
SDT	480
Manganèse	163
Cuivre	1
Zinc	3

Après iode

Nutriment	Résultat
Calcium	13
Phosphate	>10
Sodium	136
Chlorures	142
Potassium	NM
Dureté	40
pH	6,7
Alcalinité	70
Fer	134
Sulfates	89,6
Magnésium	2
SDT	475
Manganèse	178
Cuivre	97
Zinc	307

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EFFET D'UN EXCÈS D'ACIDE CHLORHYDRIQUE

Acide Chlorhydrique

Nutriment	Résultat
Calcium	2
Phosphates	NM
Sodium	94,19
Chlorures	236,33
Potassium	10,42
Dureté	5,96
pH	2,75
Alcalinité	0
Fer	233
Sulfates	27,5
Magnésium	0,1
SDT	1050
Manganèse	NM
Cuivre	NM
Zinc	NM

Acetic acid

Nutriment	Résultat
Calcium	5
Phosphates	NM
Sodium	96
Chlorures	89
Potassium	1
Dureté	12,49
pH	6,97
Alcalinité	107
Fer	175
Sulfates	21,1
Magnésium	0
SDT	311
Manganèse	24
Cuivre	32
Zinc	23

DEME
Services Vété

UN SYSTÈME DE PROFILE BIOCHIMIQUE À LA FERME: LA RECHERCHE DE L'ÉQUILIBRE

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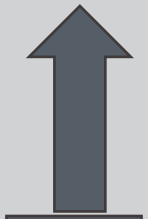
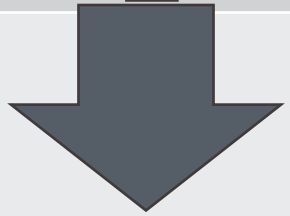
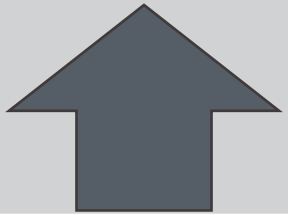
PH SANGUIN ET L'ÉQUILIBRE POUR LES RÉACTIONS CHIMIQUES DANS LES PORCS

DEME
Services Vétérinaires Inc.

LES DÉSORDRES ACIDES BASES

	Acidose métabolique	Acidose respiratoire	Alcalose métabolique	Alcalose respiratoire
pH				
pCO2				
HCO3				

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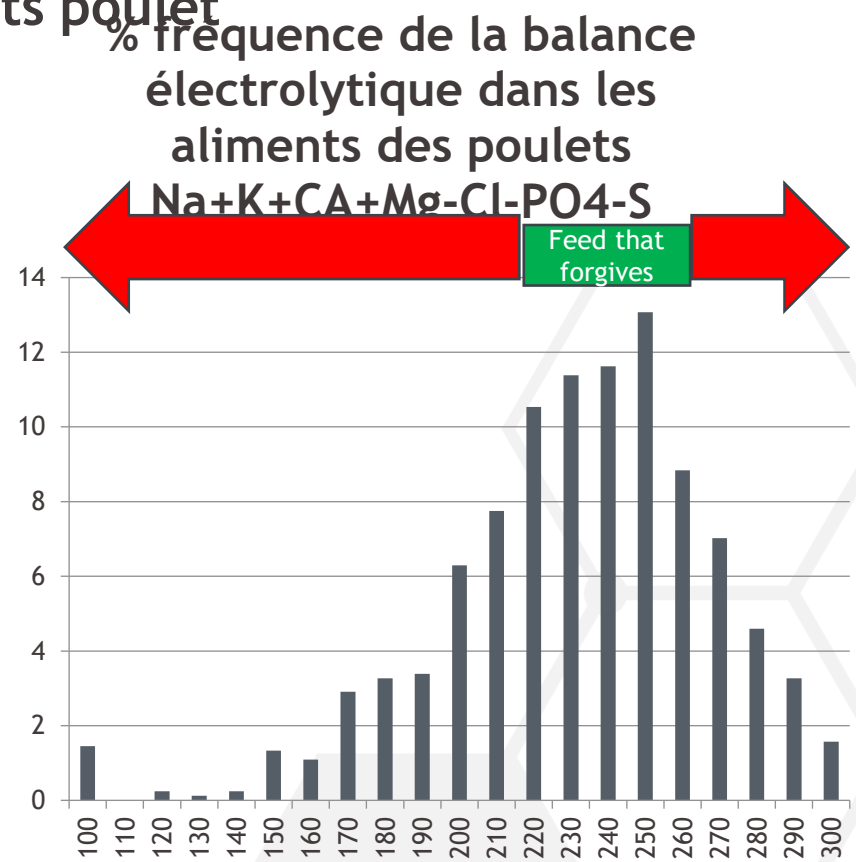
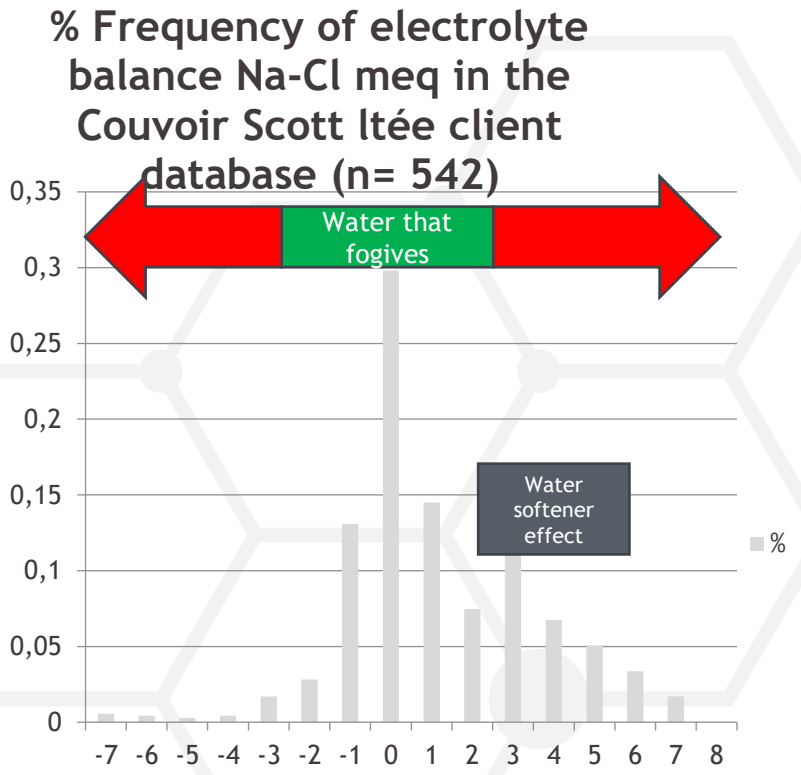
CONCEPT DE L'EFFET ADDITIF DE LA BALANCE ÉLECTROLYTIQUE DE L'EAU AVEC LA BALANCE ÉLECTROLYTIQUE DE L'ALIMENT

Distribution de la balance électrolytique des aliments poulet



Distribution de la balance électrolytique de l'eau dans les poulaillers.



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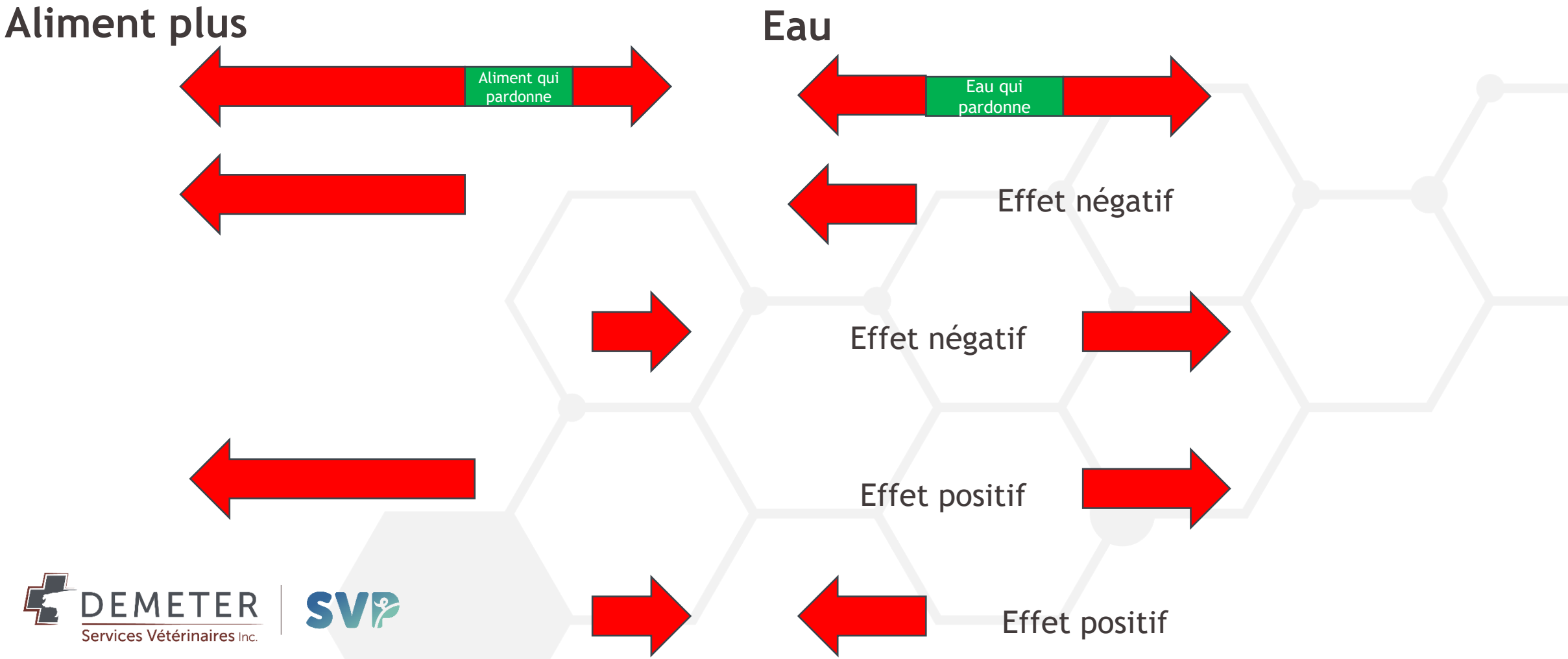
CONCEPT DE L'EFFET ADDITIF DE LA BALANCE ÉLECTROLYTIQUE DE L'EAU AVEC LA BALANCE ÉLECTROLYTIQUE DE L'ALIMENT



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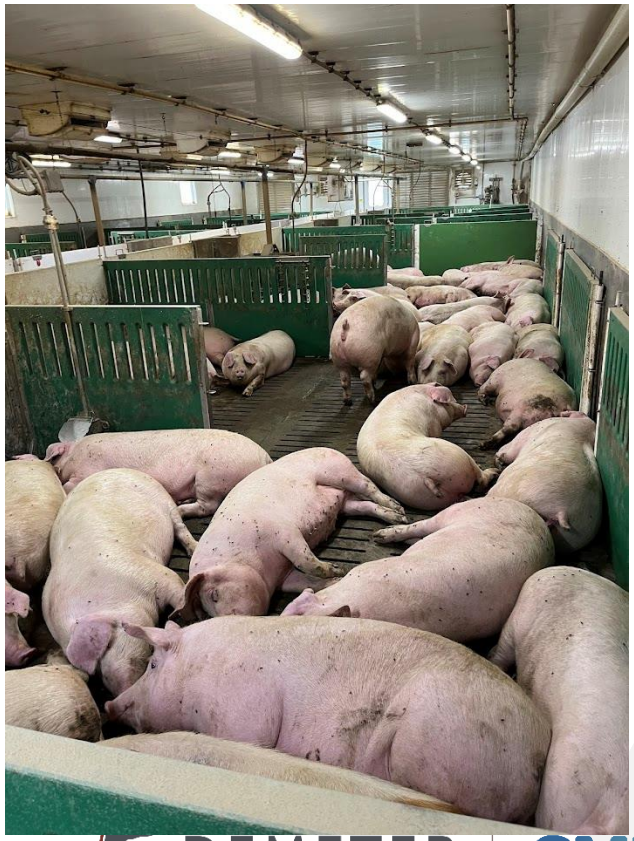
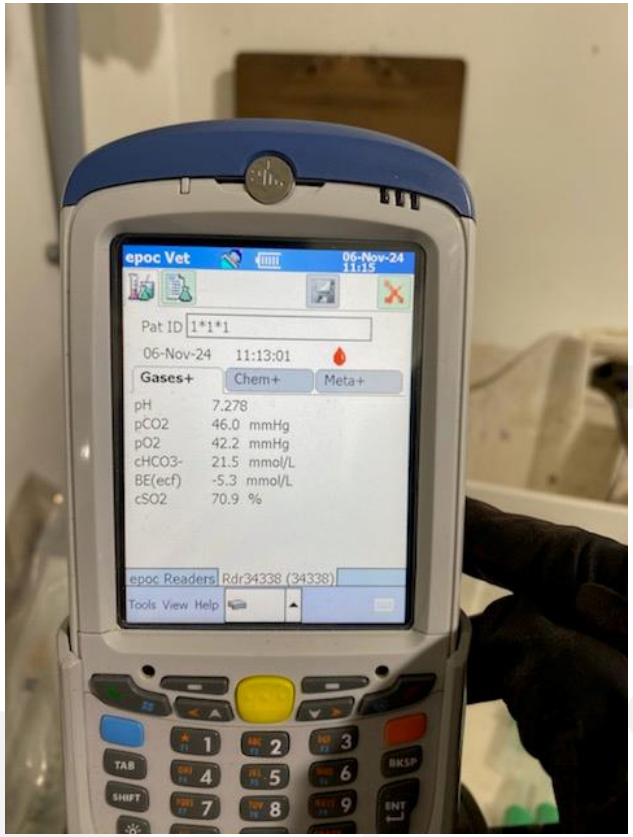
VOUS POUVEZ AIDER VOS ANIMAUX EN CONNAISSANT OÙ ILS SONT ET EN FAISANT DES AJUSTEMENTS PAR CERTAINS ADDITIFS DANS L'EAU

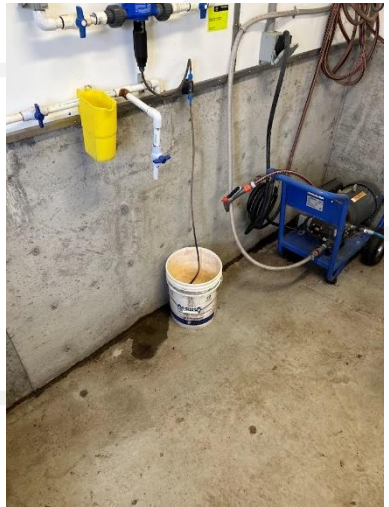
Demandez à vos animaux



Ajustez-vous en conséquence



Améliorez la santé et la profitabilité de vos animaux



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LA PAIX D'ESPRIT EN AYANT UN COCHON QUI PARDONNE

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INSPECTION VISUELLE

DEMETER
Services Vétérinaires Inc.

ÉVITEZ LA CONTAMINATION DES LIGNES D'EAU EN CONTRÔLANT CE QUE VOUS INJECTEZ DANS L'EAU

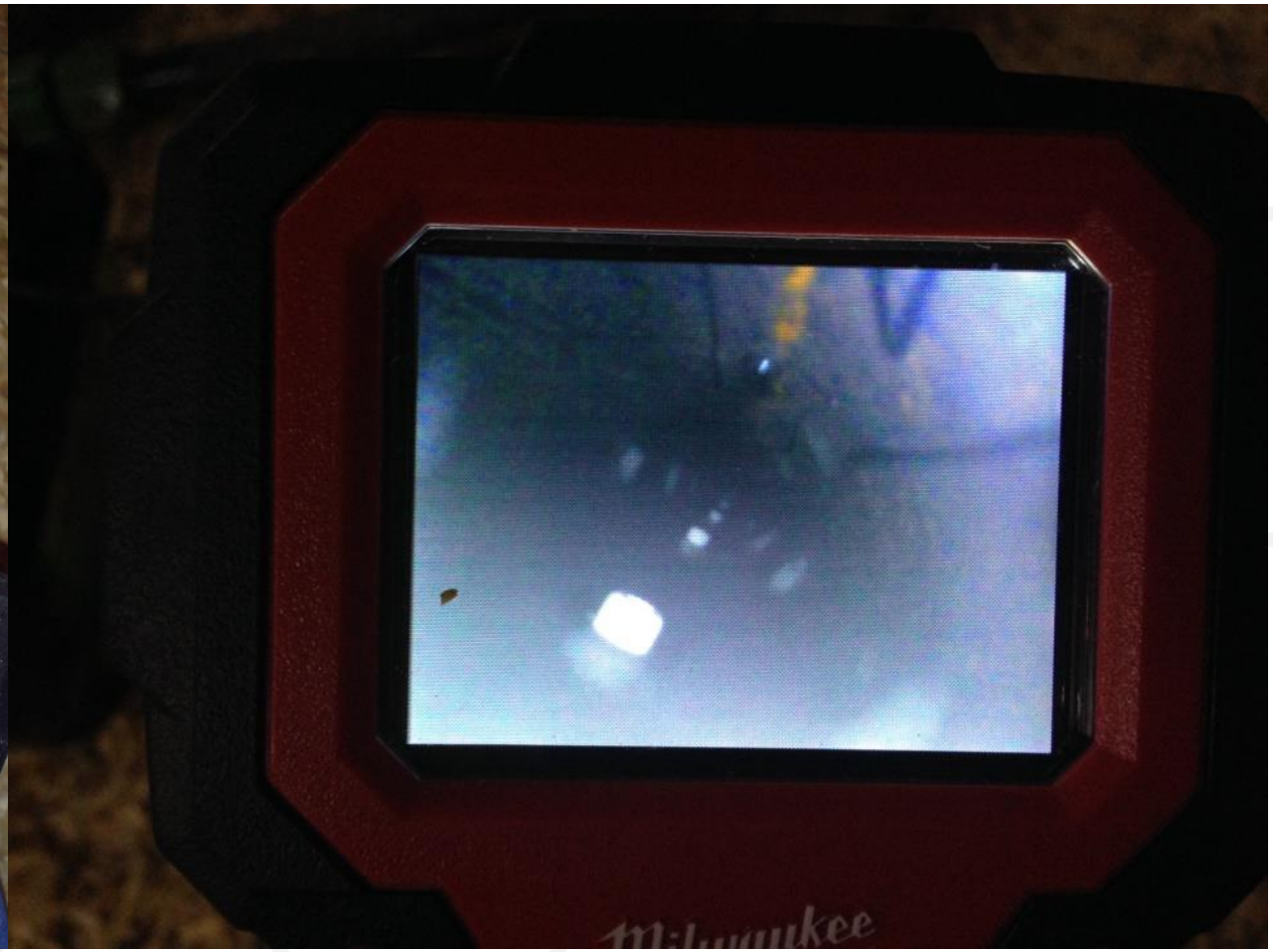
Médicamenteur dans le parquet

Médicamenteur en dehors du parquet

Contamination visible

Pas de contamination visible

UTILISATION DES CAMÉRAS D'INSPECTION



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MAINTENANCE DES RÉGULATEURS DE PRESSION

- Reconnus comme une source de contamination par Ornithobacterium rhinotracheale et Bordetella avium chez les dindons

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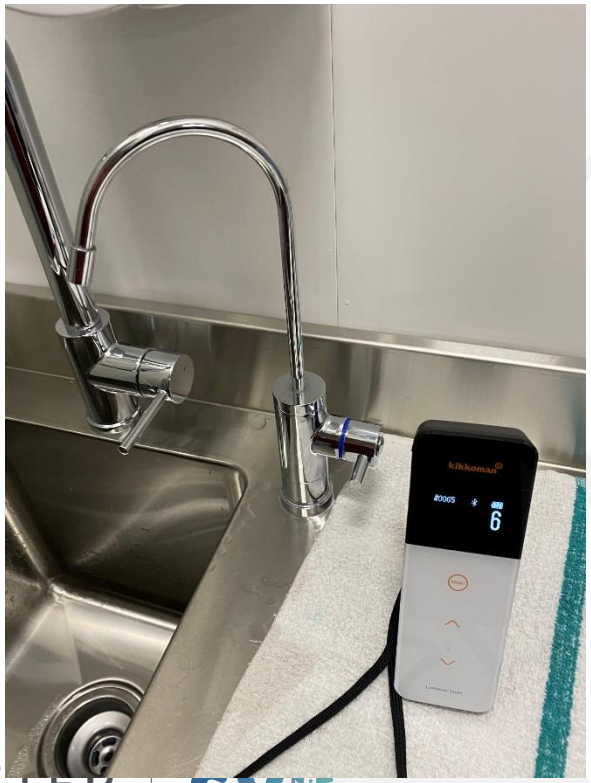
MONTREZ À VOS CLIENTS OU EMPLOYÉS CE QUI EST NORMAL

Eau de la ville avec chlore 6 RLUs



Une colonie bactérienne 64550 RLUs

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COMMENT MESURER LA QUALITÉ D'EAU? EXEMPLE AVEC ORP MÈTRE ET ATP MÈTRE

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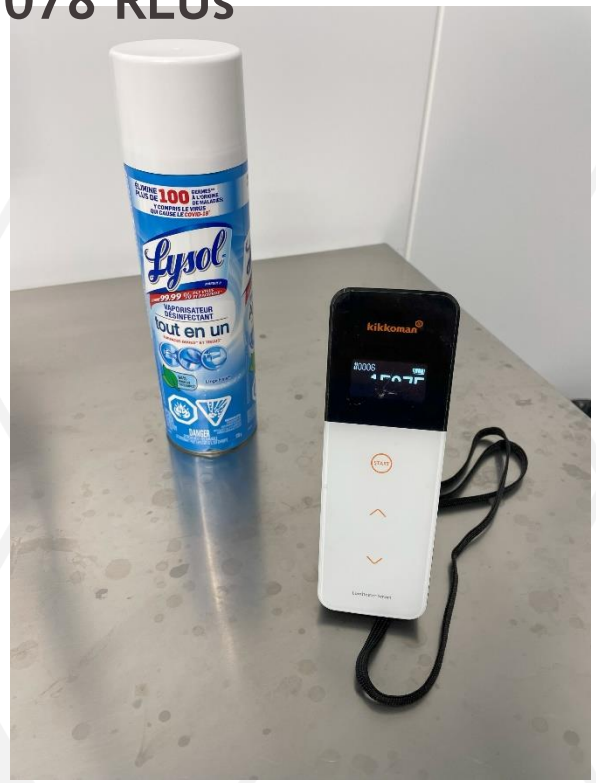
RÉTROACTION IMMÉDIATE

Table avant désinfection

18400 RLUs

Ammonium quaternaire facile mais pas très efficace

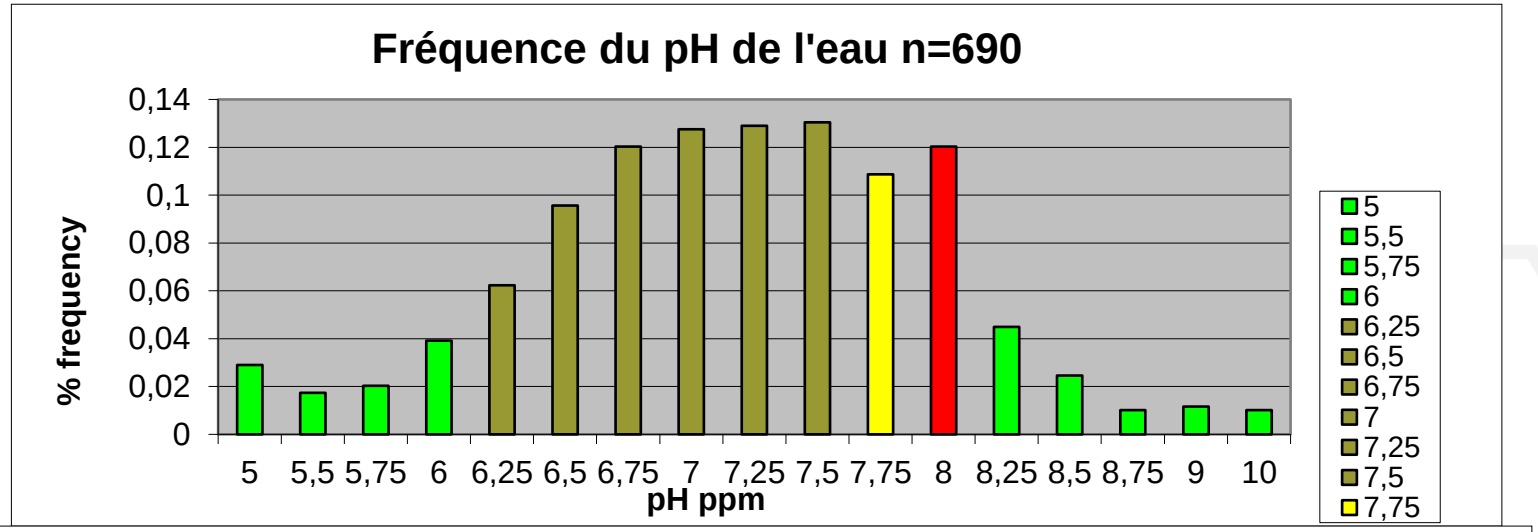
15078 RLUs

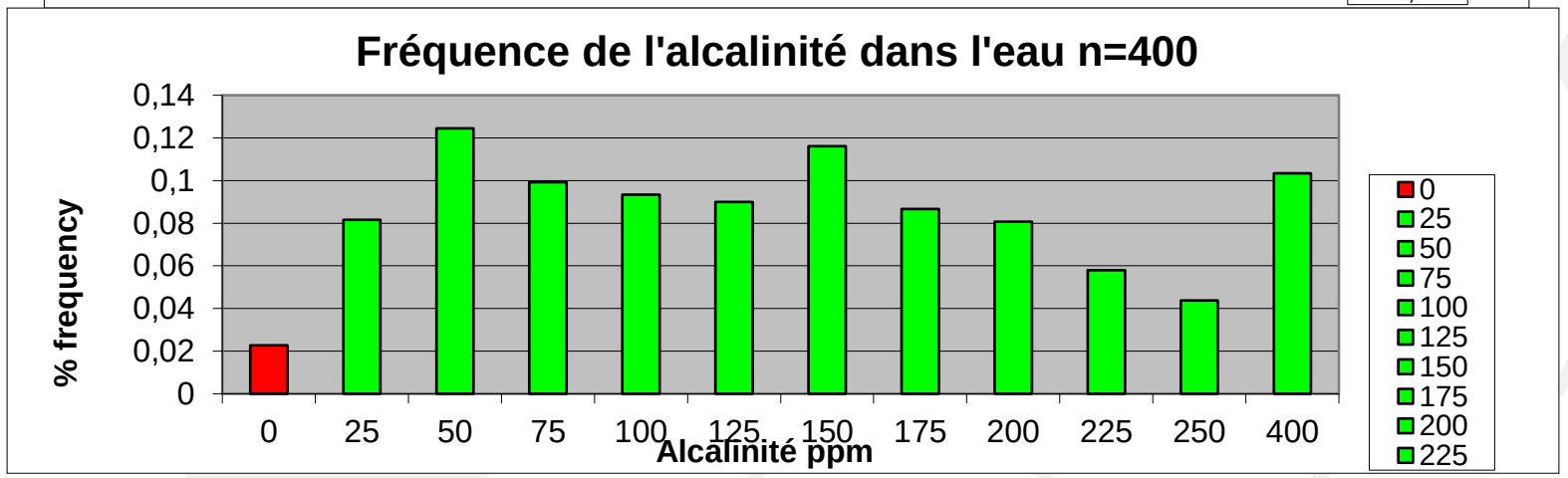


Le chlore ne sent pas aussi bon mais est plus efficace 3641 RLUs

Services Vétérinaires Inc.

FREQUENCY OF ALKALINITY IN WATER HAS AN INFLUENCE ON THE AMOUNT OF ACID NEEDED TO ACIDIFY WATER, HAS AN EFFECT ON THE CORROSIVENESS OF ACIDIFIED WATER





- Attention à
- l'ammoniac dans
- le bâtiment car
- elle peut réagir
- avec les bandelettes

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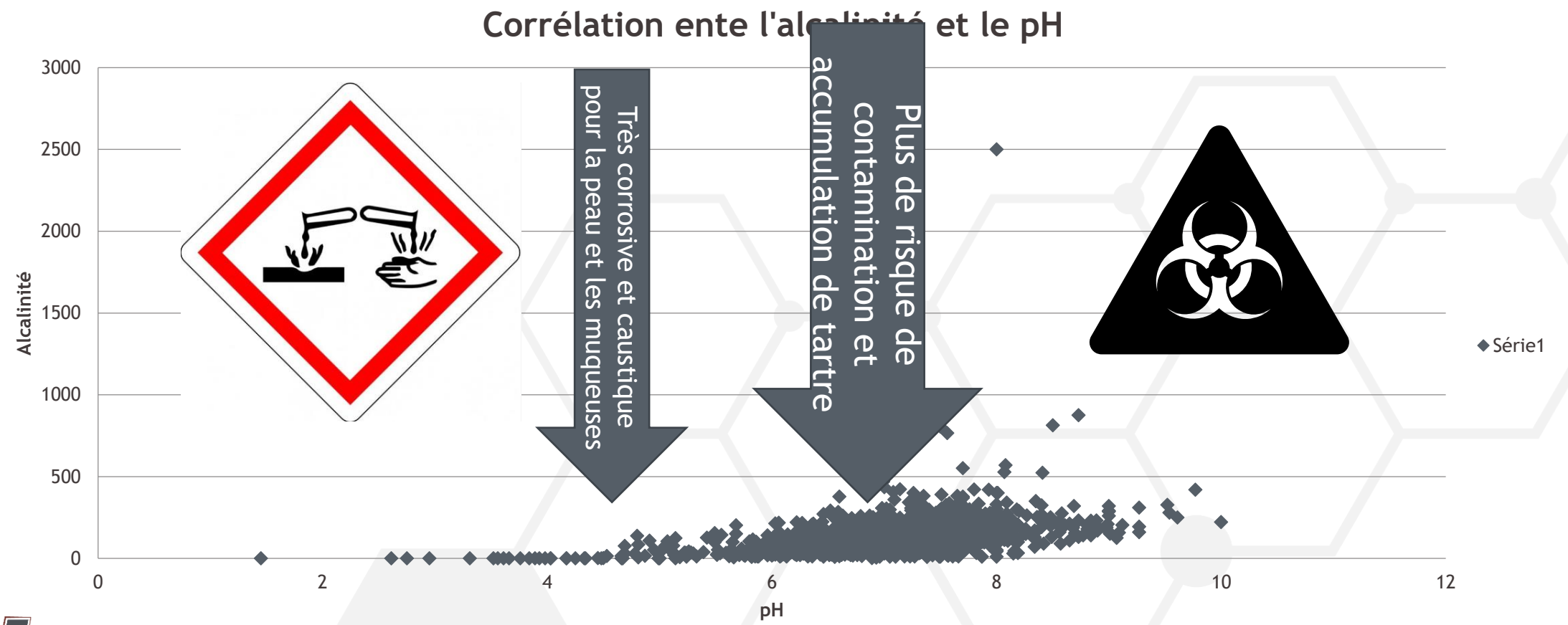
CORRÉLATION ENTRE L'ALCALINITÉ ET LE PH



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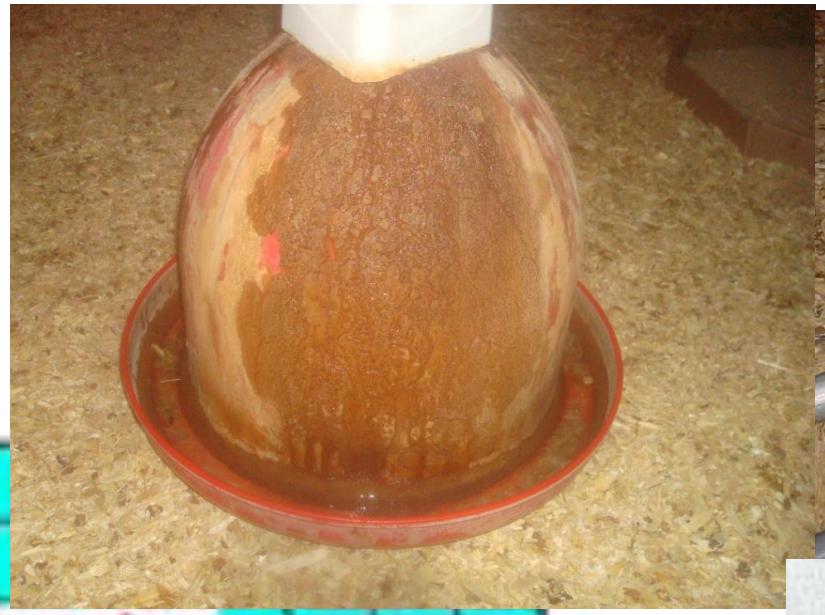
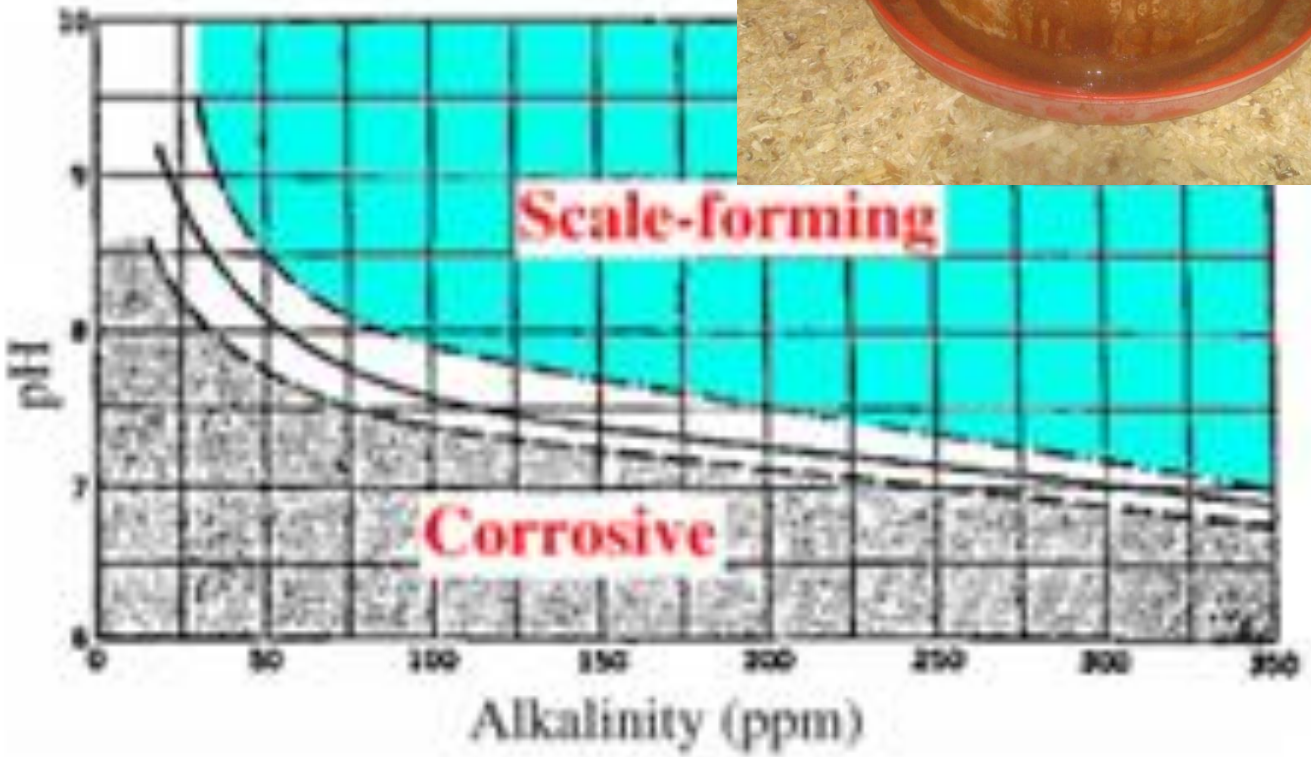
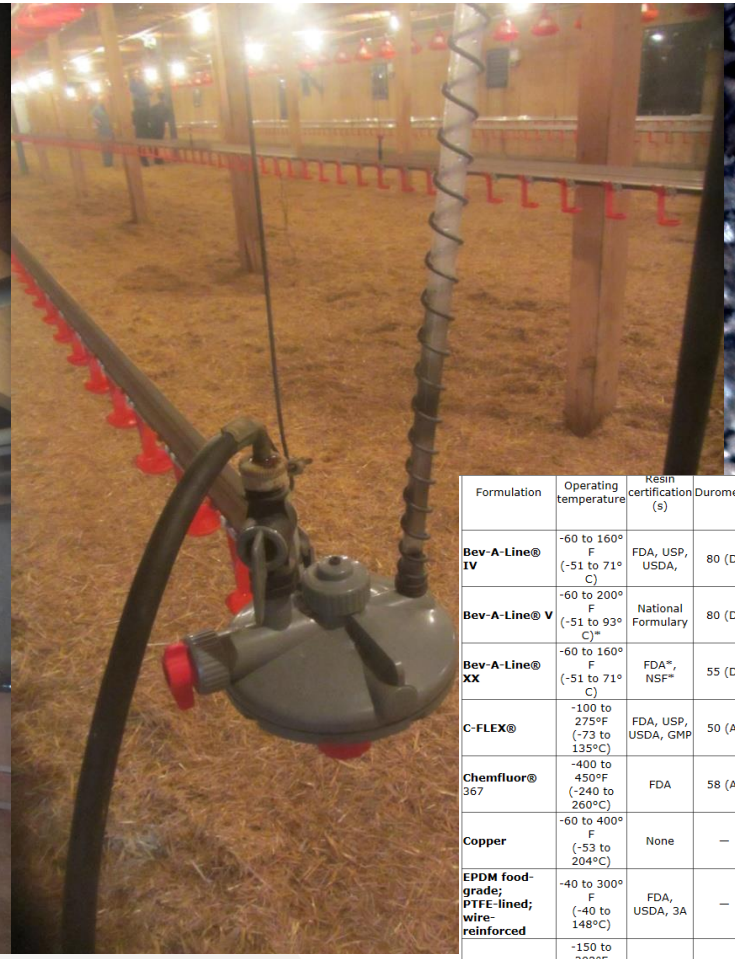
CALCIUM ET ALKALINITÉ ET L'ACCUMULATION DE TARTRE

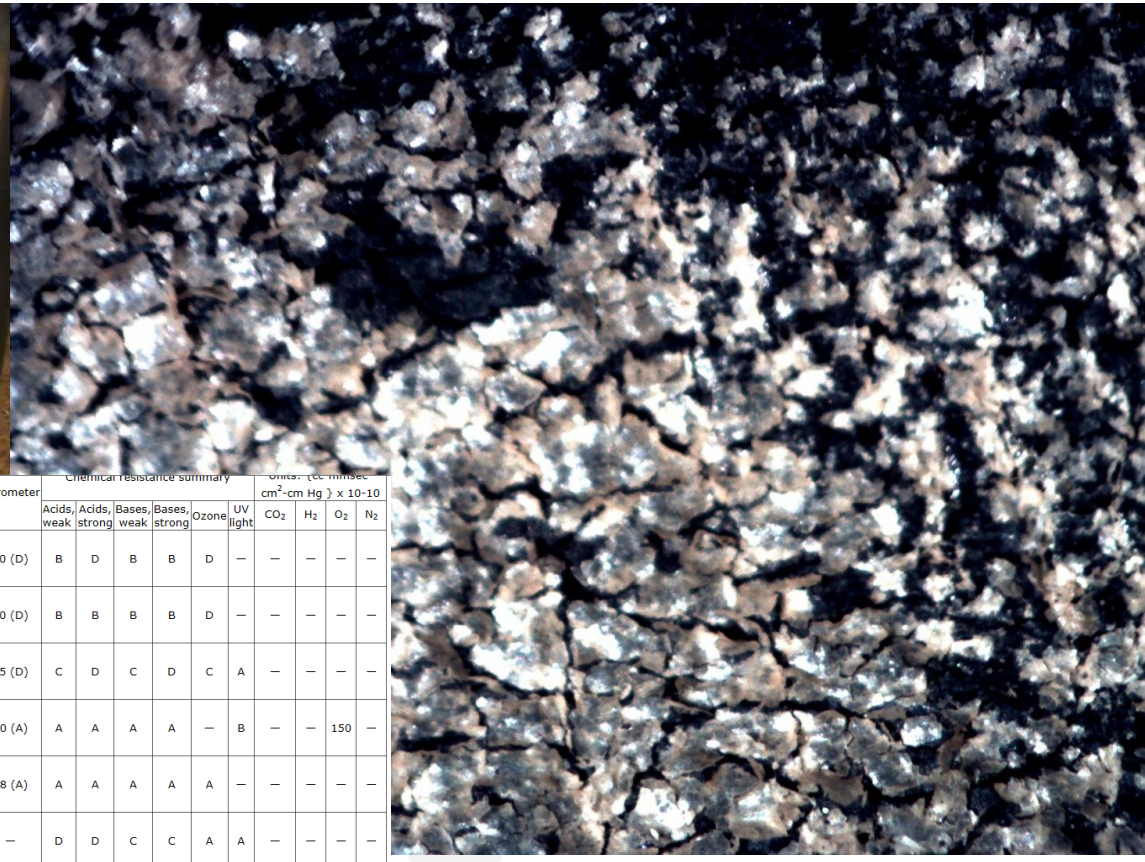




TEST D'ASSAINISSEUR D'AMMONIUM QUATERNAIRE AFIN DE S'ASSURER DU BON DOSAGE ET S'ASSURER QU'IL N'Y A PAS DE RÉSIDUS LORS DU PLACEMENT ET L'IRRITATION QUI EST RELIÉE

TUBULES NON APPROPRIÉE NE RÉSISTANT AS À L'ACIDE ET AU CHLORE





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Formulation	Operating temperature	Resin certification (s)	Durometer	Chemical resistance summary						Units: (cc mil/sec cm^2-cm Hg) x 10-10			
				Acids, weak	Acids, strong	Bases, weak	Bases, strong	Ozone	UV light	CO_2	H_2	O_2	N_2
Bev-A-Line® IV	-60 to 160° F (-51 to 71° C)	FDA, USP, USDA,	80 (D)	B	D	B	B	D	—	—	—	—	—
Bev-A-Line® V	-60 to 200° F (-51 to 93° C)*	National Formulary	80 (D)	B	B	B	B	D	—	—	—	—	—
Bev-A-Line® XX	-60 to 160° F (-51 to 71° C)	FDA*, NSF*	55 (D)	C	D	C	D	C	A	—	—	—	—
C-FLEX®	-100 to 275°F (-73 to 135°C)	FDA, USP, USDA, GMP	50 (A)	A	A	A	A	—	B	—	—	150	—
Chemfluor® 367	-400 to 450°F (-240 to 260°C)	FDA	58 (A)	A	A	A	A	A	—	—	—	—	—
Copper	-60 to 400° F (-53 to 204°C)	None	—	D	D	C	C	A	A	—	—	—	—
EPDM food-grade; PTFE-lined; wire-reinforced	-40 to 300° F (-40 to 148°C)	FDA, USDA, 3A	—	A	B	A	A	—	—	—	—	—	—
ETFE	-150 to 302°F (-101 to 150°C)	GMP	75 (D)	A	A	A	A	A	A	—	—	—	—
FEP	-454 to 400°F (-270 to 205°C)	FDA, USP, GMP	55 (D)	A	A	A	A	A	A	5.9	1.3	14	2.0
Gum rubber	-15 to 158° F (-26 to 70° C)	GMP	35 (A)	A	D	A	B	C	D	1311	492	307	118

Tubing Selection Guide

Chemical Resistance Classifications

A—No damage after 30 days of constant exposure.
B—Little or no damage after 30 days of constant exposure.
C—Some effect after 7 days of constant exposure. Effects may include: cracking, crazing, loss of strength, discoloration, softening, or swelling. Softening and swelling are reversible in some cases.
D—Not recommended for continuous use. Immediate damage may occur.
"_" Test data unavailable or not applicable.

RÉDUCTION DE LA CONTAMINATION PAR L'UTILISATION DES VALVES ANTI-RETOUR

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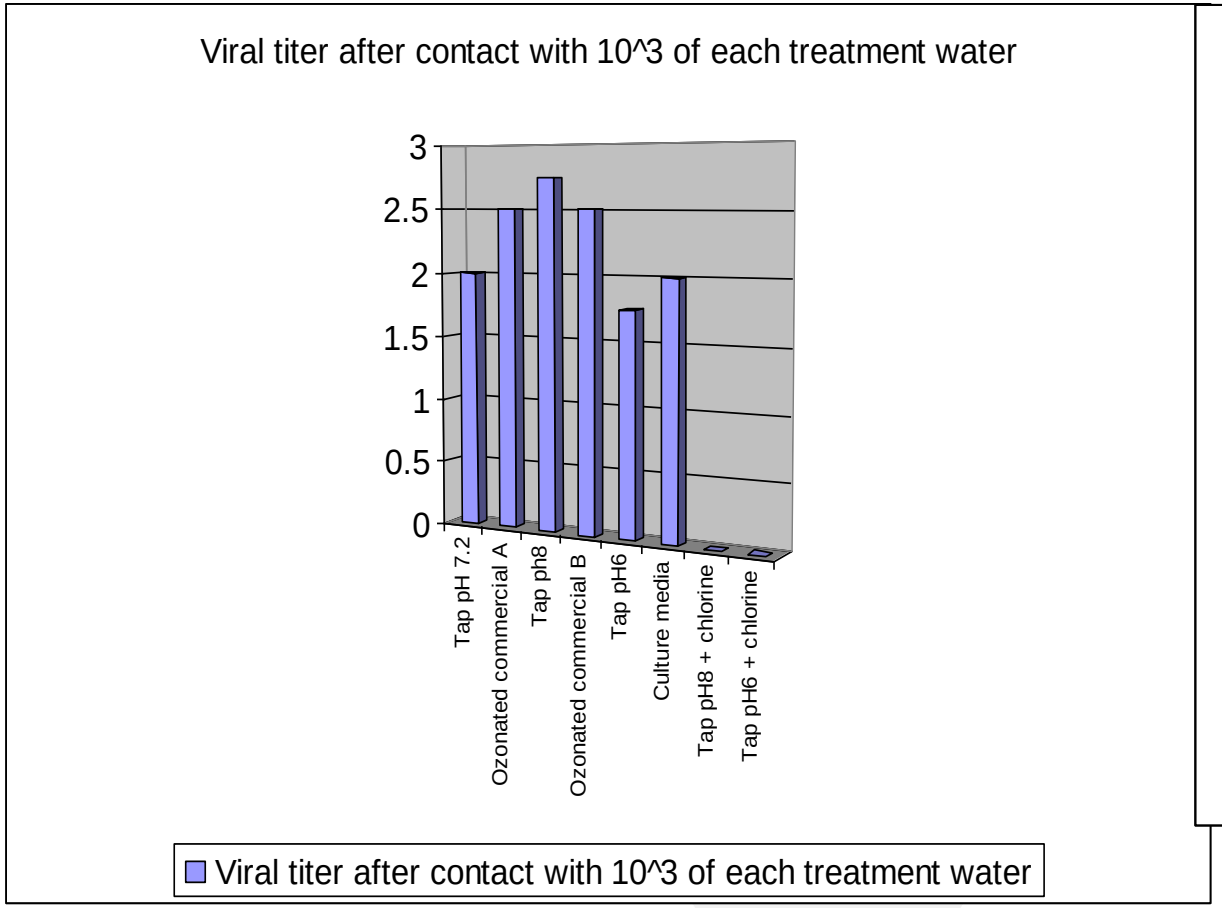
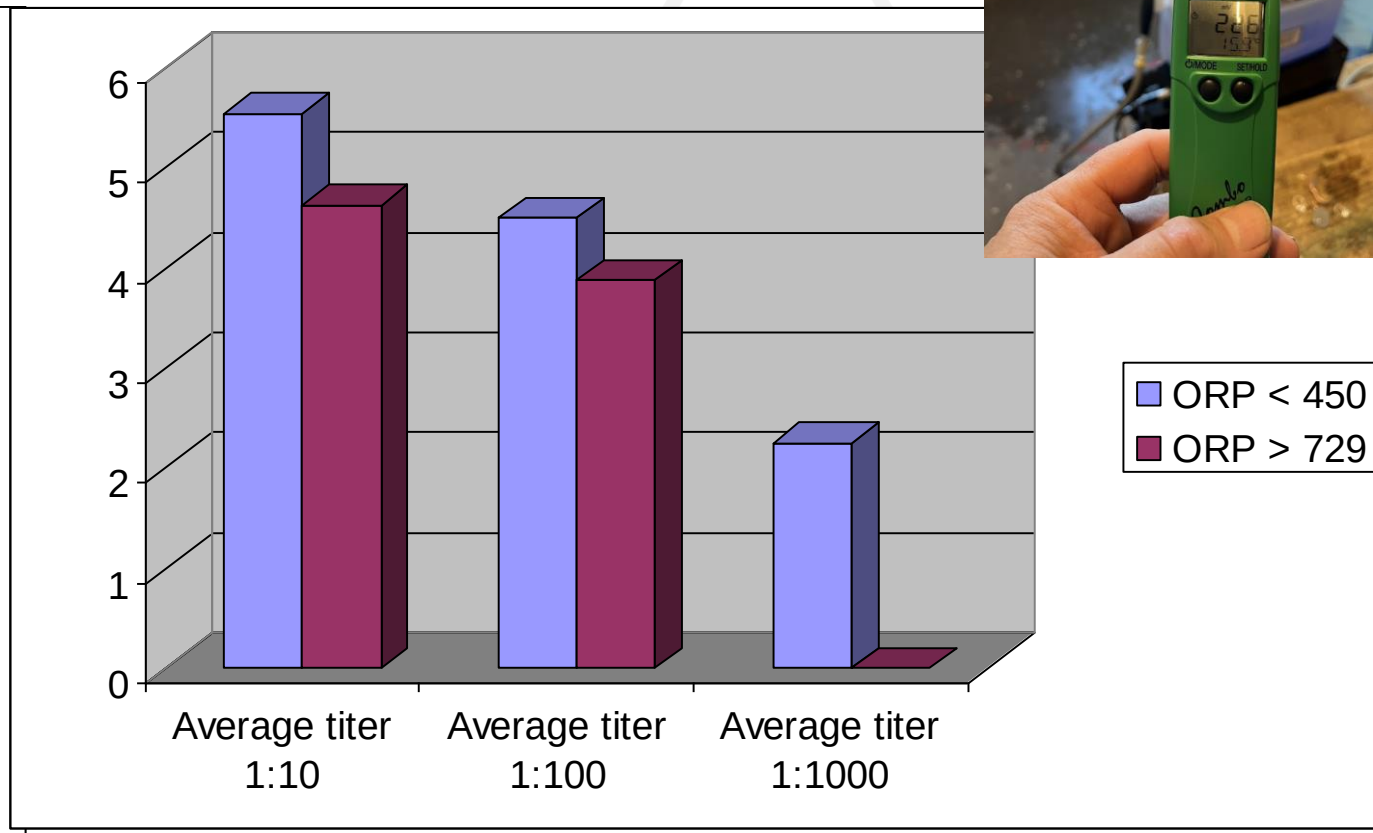
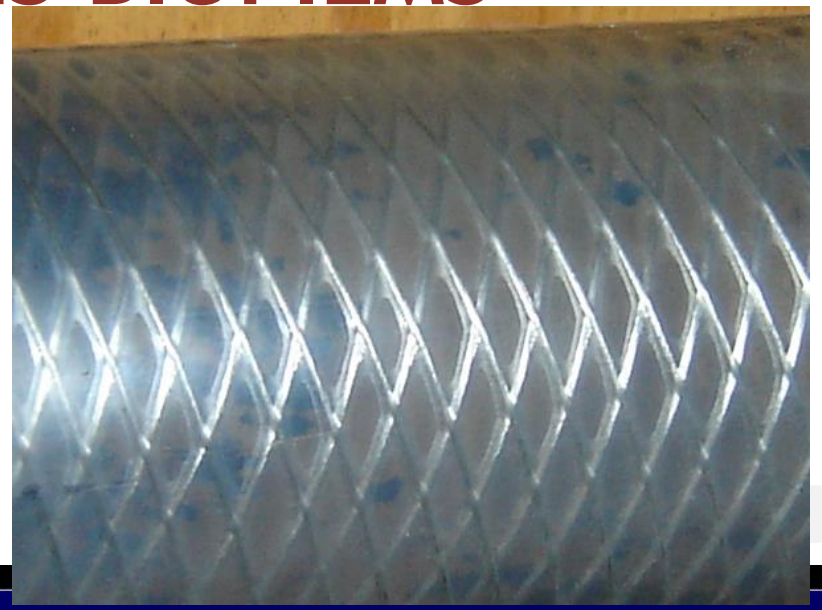
QU'EN EST-IL DES VIRUS DANS L'EAU?
RÉDUCTION DU TITRE VIRAL IBD(MALADIE DE GUMBORO) DANS DIFFÉRENTES EAUX ET ENVIRONNEMENTS CELA VEUX AUSSI DIRE QUE VOUS VOULEZ UN ORP BAS POUR VACCINER DANS L'EAU





LES DÉSAVANTAGES DES BIOFILMS



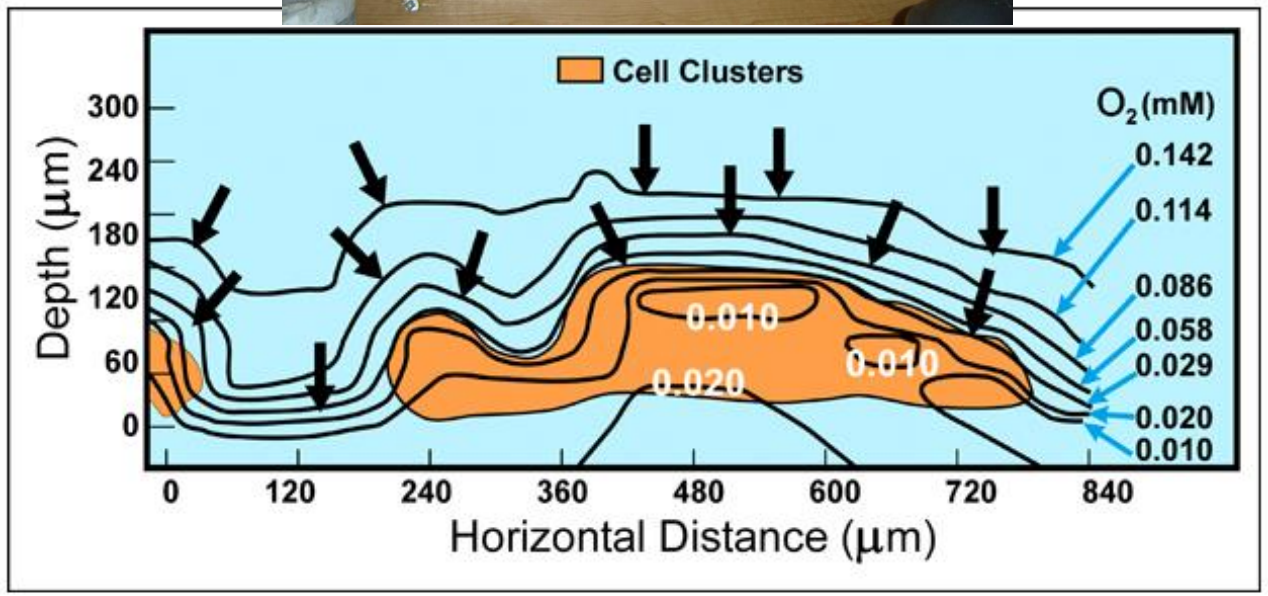
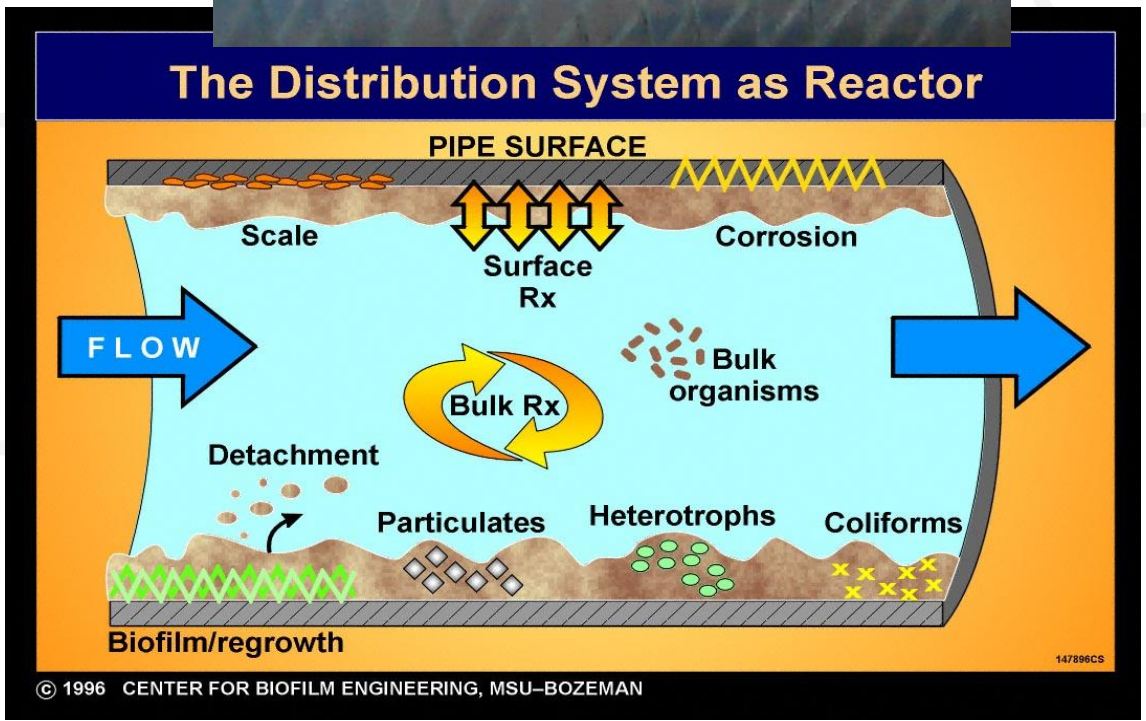


Figure 1. Oxygen concentration contours mapped around a three-species biofilm cell cluster.
Oxygen concentration contours mapped around a three-species biofilm cell cluster using microelectrode technology. The substratum on which the biofilm grew was at the bottom and the aqueous medium at the top. Black arrows indicate the direction of the local flux of oxygen.



LES EFFETS NÉGATIFS DES BIOFILMS

- Tétines qui dégouttent = litière humide
- Présence de bactéries pathogènes
- Neutralisation des assainisseurs
- Risque augmenté de résistance aux antibiotiques

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EAU AVEC DES NIVEAUX ÉLEVÉS DE MANGANÈSE PRÉCIPITÉ PAR L'IODE SUITE À UN BRIS DE L'ADOUCISSEUR

- Avant flush

- Après flush

COMMENCER PROPRE PERMET DE RESTER PROPRE

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CAMÉRA D'INSPECTION

- Avant flush

- Après flush

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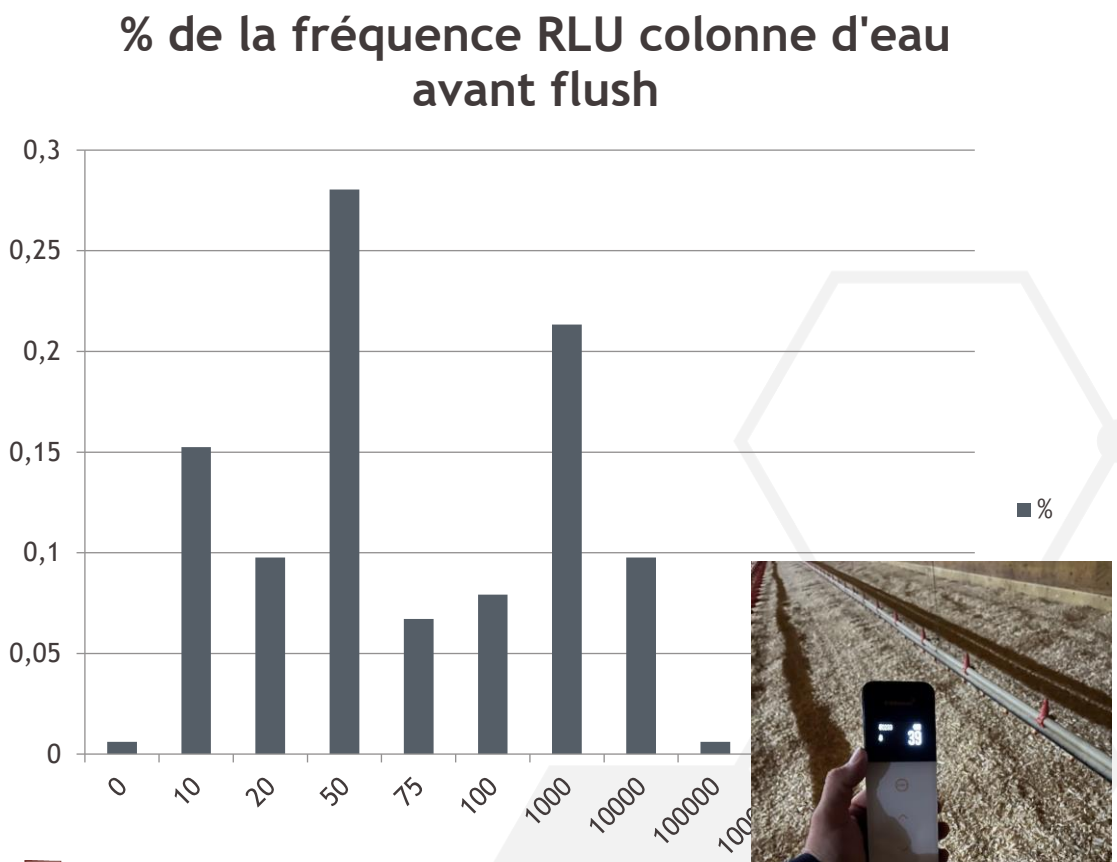
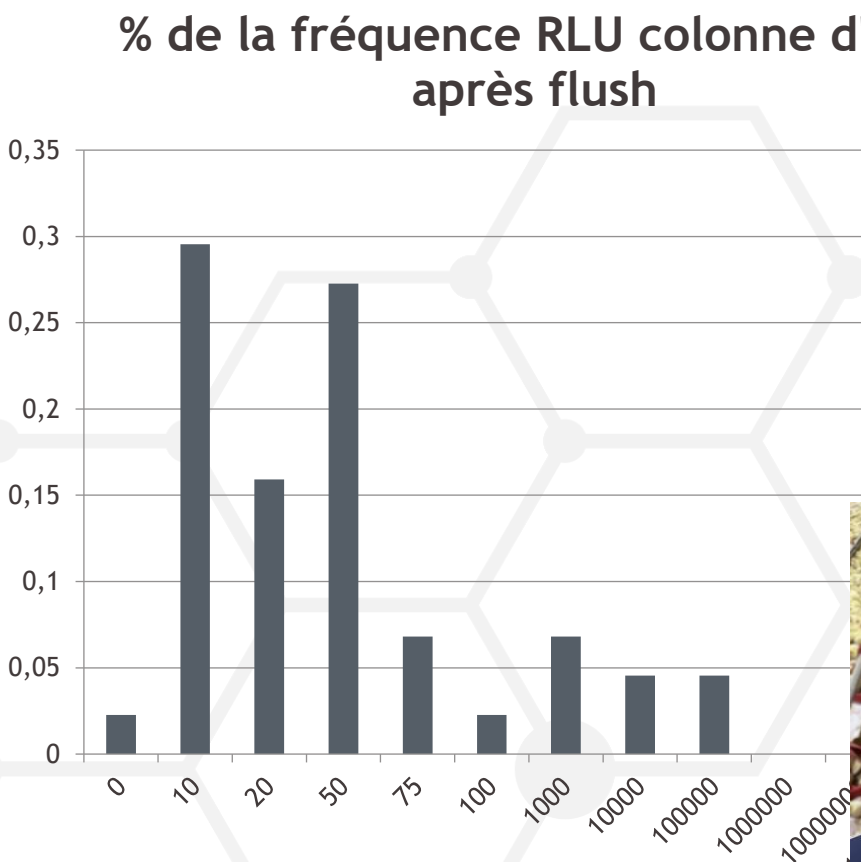
EFFET DU RINÇAGE DES LIGNES D'EAU SUR LES RLU'S





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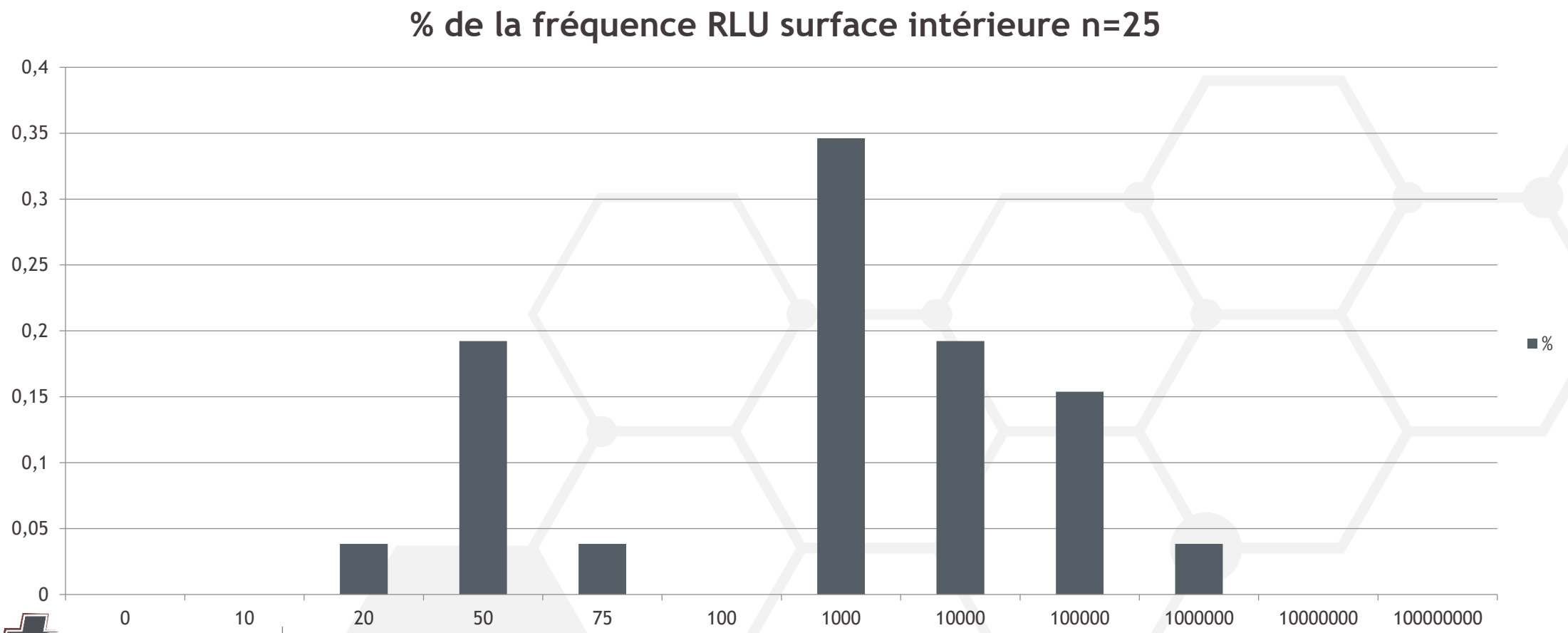
RLU DU BIOFILM DANS LA LIGNE D'EAU



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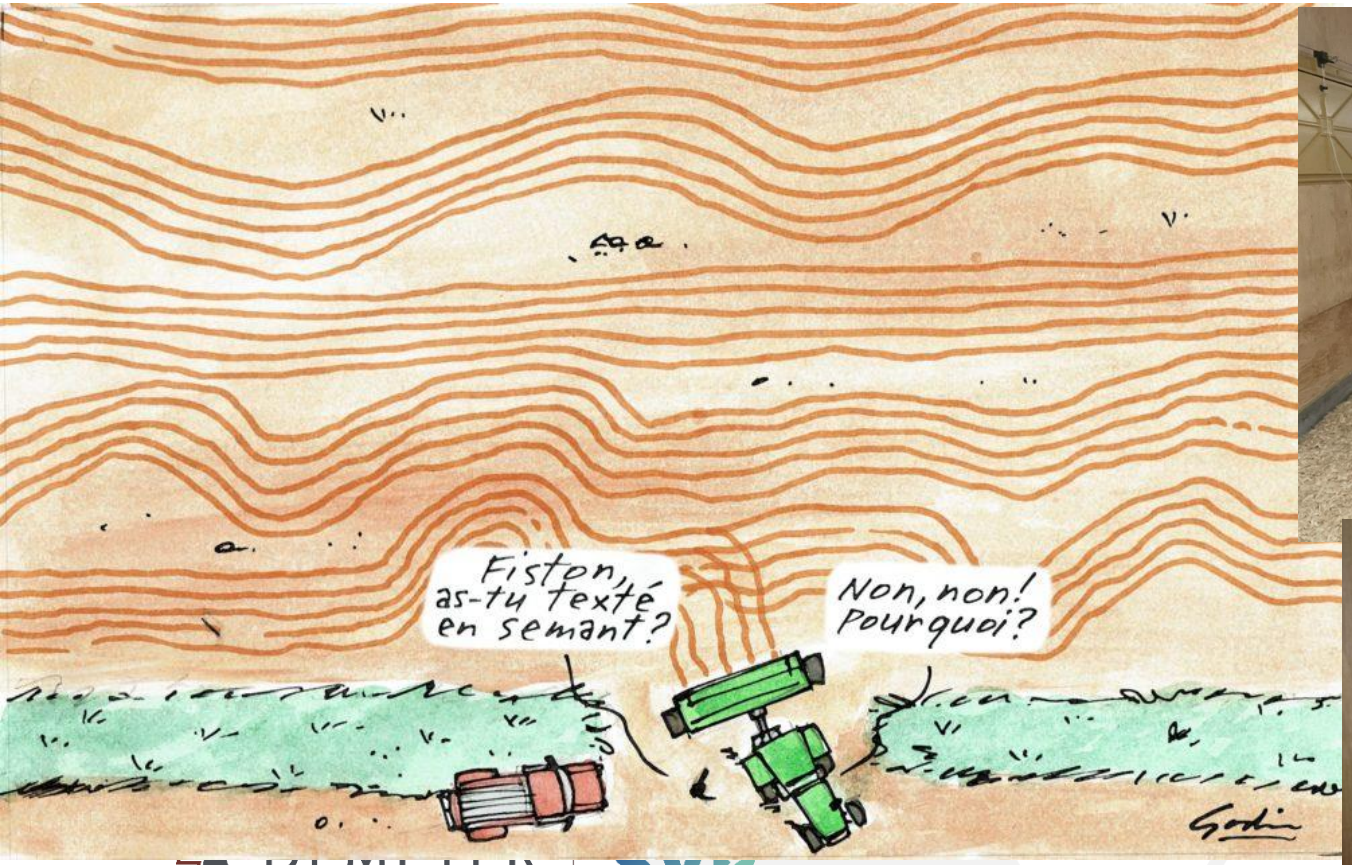
PARFOIS UN CLIENT VOUS DEMANDE POURQUOI MES ANIMAUX MEURENT SUR UN SEUL ÉTAGE OU PARQUET ALORS QU'ILS ONT TOUS LA MÊME EAU?

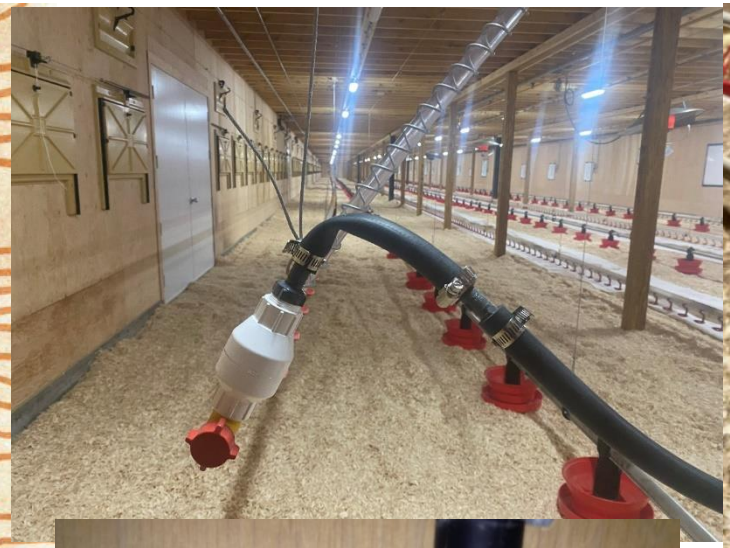
ÊTRE DISTRAIT EST HUMAIN

CERTAINS HUMAINS SONT PLUS HUMAINS QUE LES AUTRES

Oublier de rincer une ligne d'eau sur 12 dans un poulailler



Tuyeau plié empêchant le rinçage d'une ligne d'eau



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EXEMPLE AVEC DE L'IODE D'ABREUVAGE DANS L'EAU?

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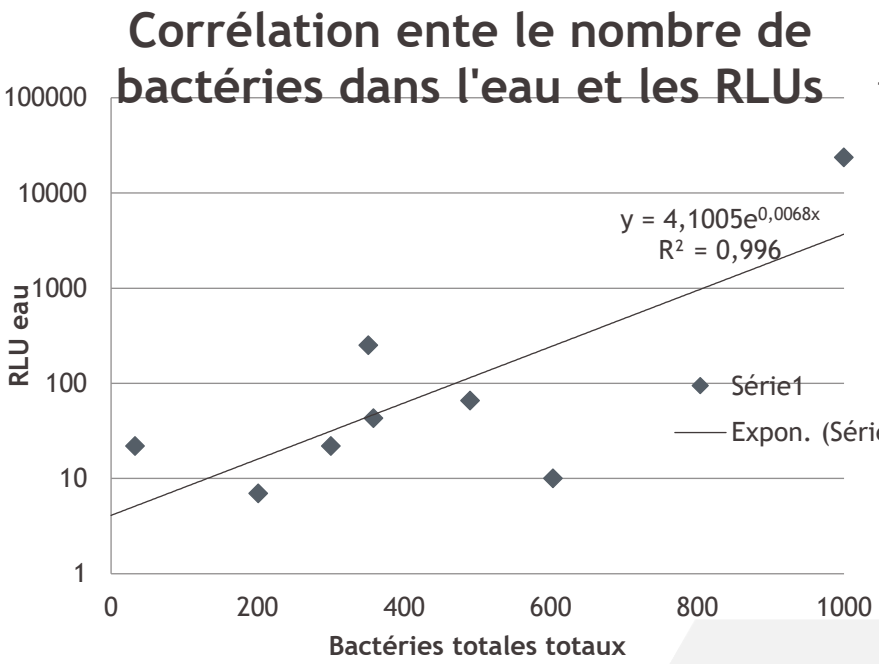
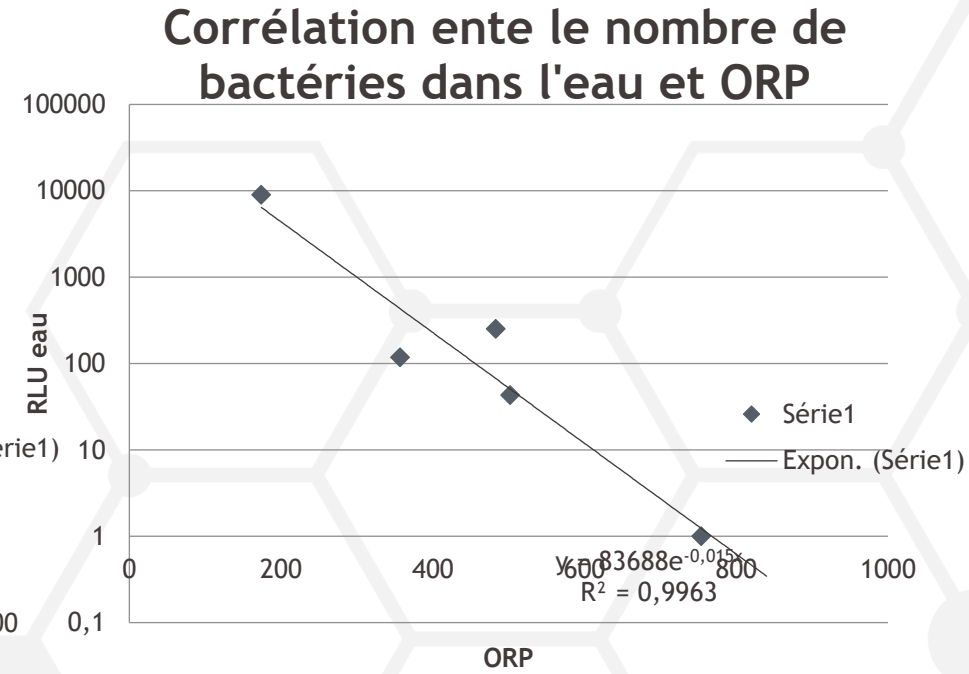
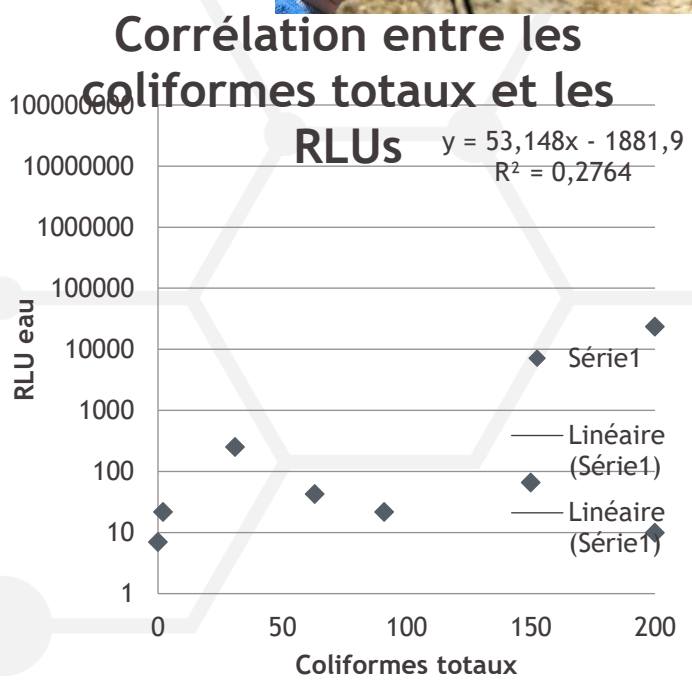
QUE VEUT DIRE RLU? (RELATIVE LIGHT UNIT UNITÉ RELATIVE DE LUMIÈRE COMMENT ÇA SE COMPARE À LA BACTÉRIOLOGIE CONVENTIONNELLE?







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CAN SOME FACTORS AFFECT ORP AND BACTERIA LEVELS STILL BE LOW?

- Oui
- Si un autre assainisseur que le chlore est utilisé
  - Iode
  - Peroxydes
- Antioxydants
  - Vitamine C
  - Vitamine A D E?
- Antibiotiques
  - Pot pen
- Matériel organique ou additifs dans l'eau

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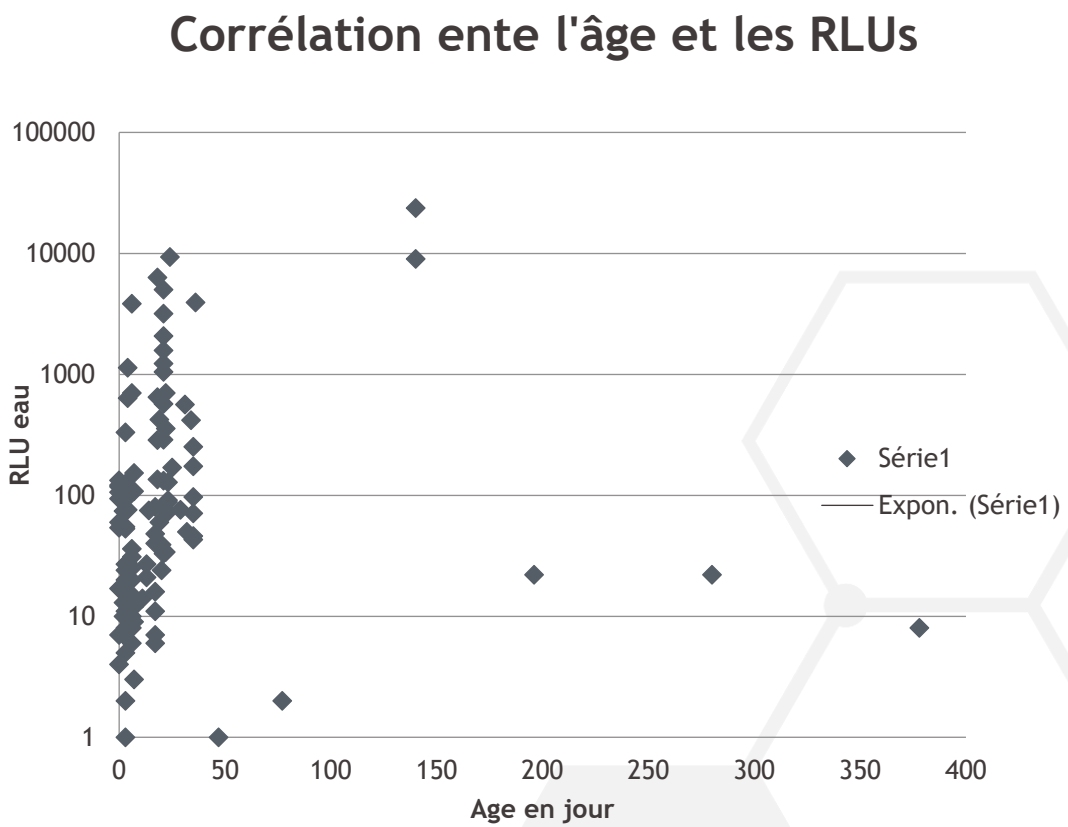
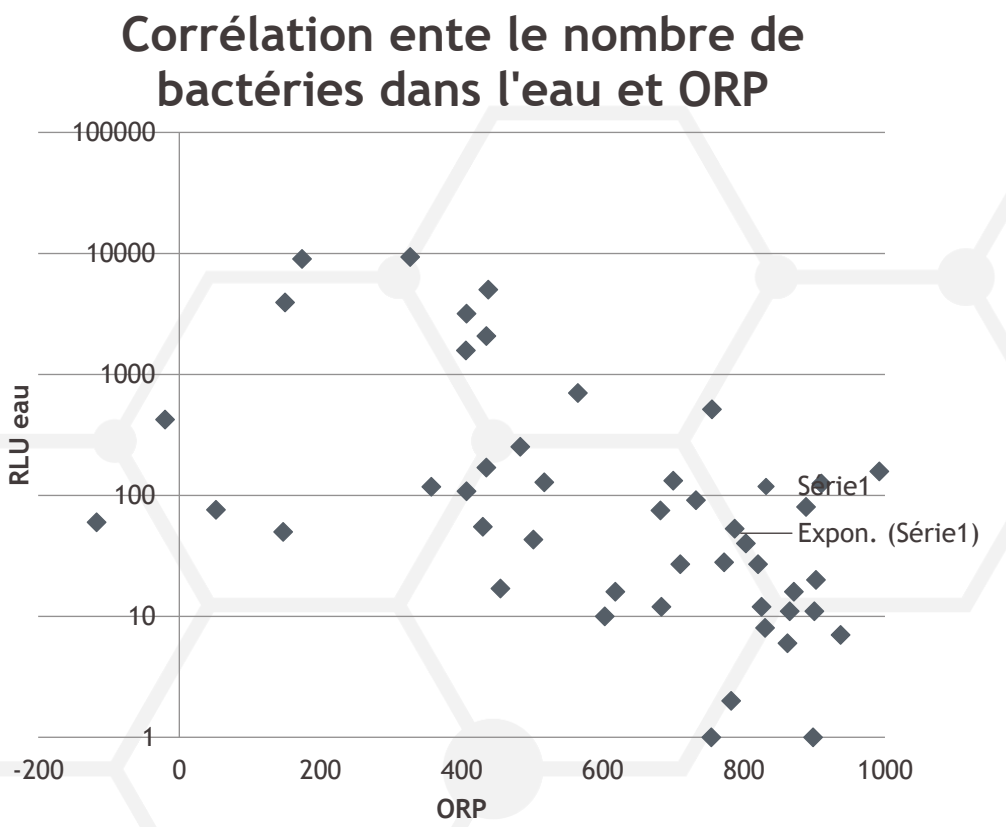
CORRÉLATION ENTRE L'ÂGE DES OISEAUX ET LES RLUS AINSI QUE L'ORP ET LES RLUS





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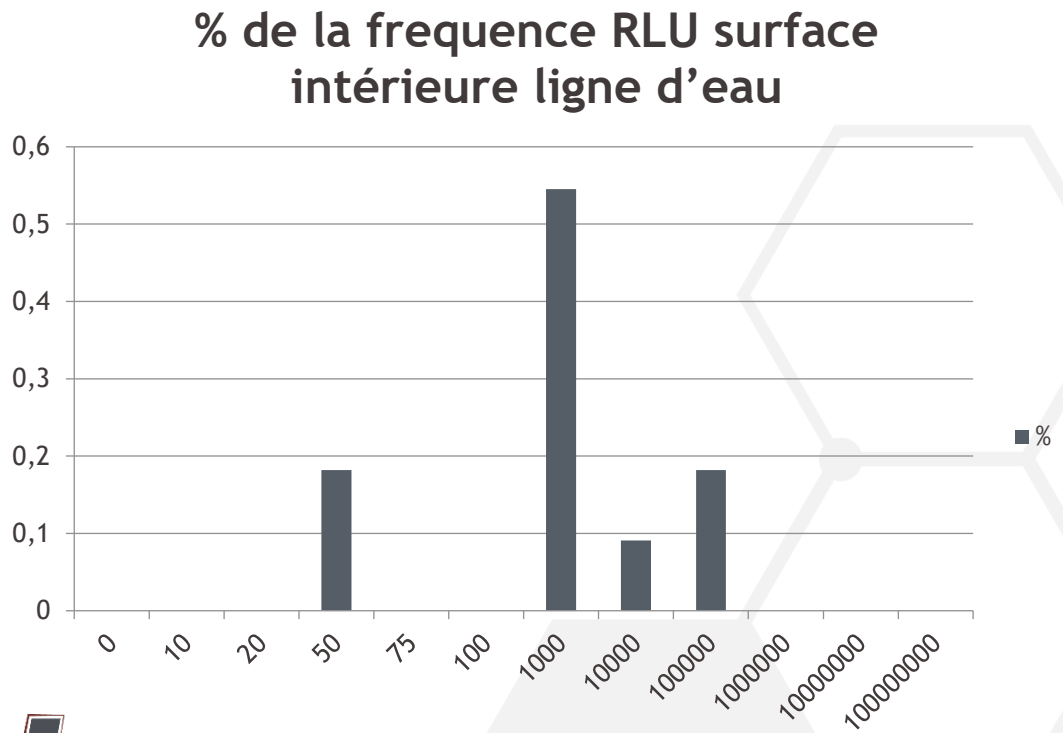
EXEMPLE CLINIQUE

Ligne d’eau d’un poulailler avec mortalité élevée à 5 jours d’âge



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EST-CE QUE CERTAINS FACTEURS PEUVENT AFFECTER L'ORP ET QUE LE NIVEAU DE BACTÉRIES RESTE BAS?

- Oui
- Autres assainisseurs que le chlore
  - Iode
  - Peroxydes
- Antioxydants
  - Vitamine C
  - Vitamine A D E?
- Antibiotiques
  - Pot pen
- Matériel organique ou additifs dans l'eau

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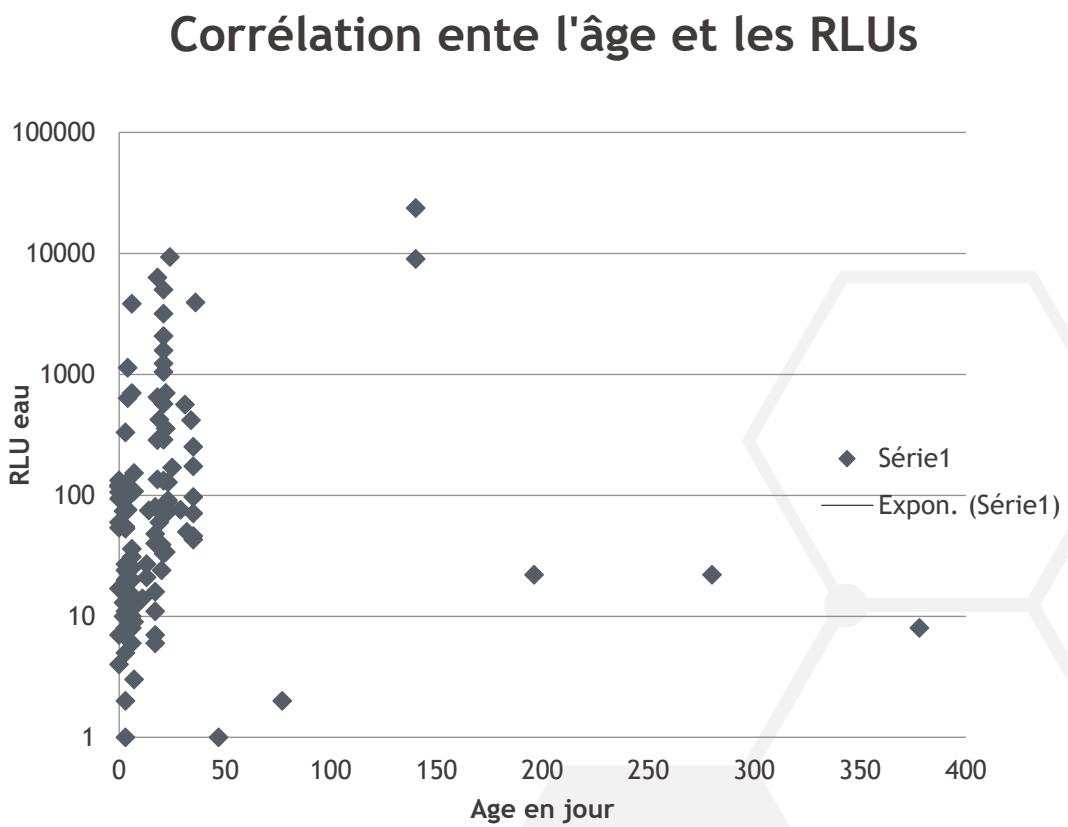
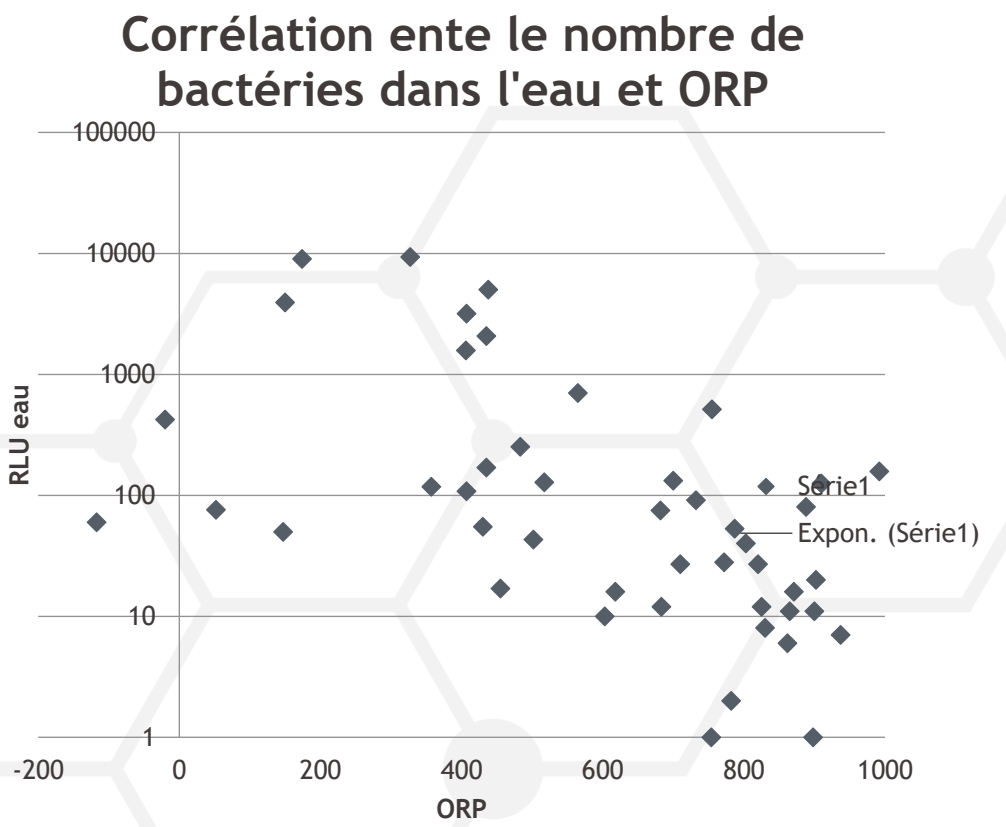
CORRELATION ENTRE L'ÂGE DES OISEAUX ET LES RLU'S AINSI QUE L'ORP ET LES RLU'S





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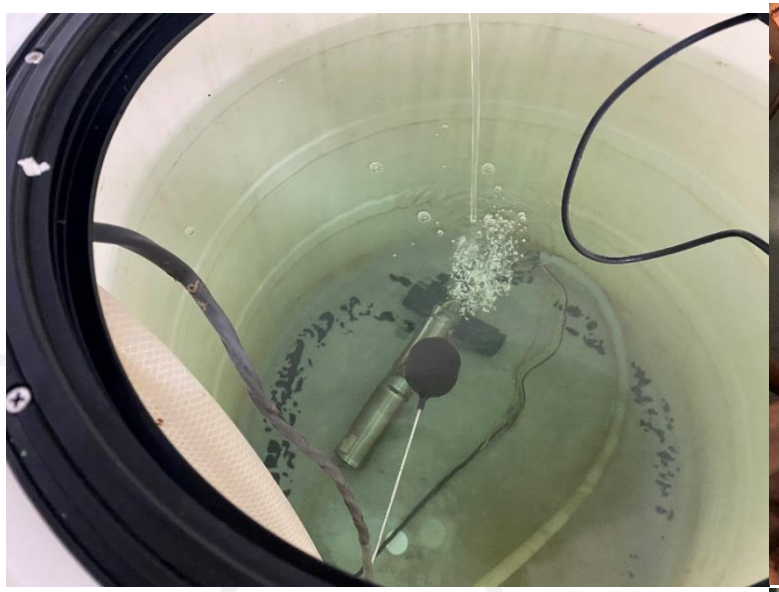
LES RÉSEREVES D'EAU

Réserve d'eau avant la chloration

Réserve d'eau après la chloration 5 RLUs



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CONCLUSIONS

- Connaissez votre eau
- Analyse physico chimique
- Rendez votre eau plus capable de pardonner
- Utilisez votre eau pour traiter certaines conditions
- Assainissez votre eau
- Mesurez pour avoir du succès
- Utilisez le bon assainisseur pour votre type d'eau
- Évaluez chaque paramètre individuellement
- Évaluez les ratios aussi
- Traitez votre eau non seulement pour la santé de vos animaux mais aussi afin de potentialiser l'efficacité des traitements et la vaccination et por réduire la résistance aux antiimicrobiens.

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CONCLUSIONS

Quality norms for water	Good	Take action
• pH	5.5-8.5	<4 or >9
• Ammonium (mg/l)	<1.0	>2.0
• Nitrite (mg/l)	<0.10	>1.00
• Nitrate (mg/l)	<100	>200
• Chloride (mg/l)	<250	>2,000
• Sodium (mg/l)	<400	>800
• Sulfate (mg/l)	<150	>250
• Iron (mg/l)	<0.5	>10.0
• Manganese (mg/l)	<1.0	>2.0
• Hardness (ppm)	<60	>300
• Coliforms (cfu/ml)	<100	>100
• Total bacterial count (cfu/ml)	<100,000	>100,000

For support in improving the quality of your pigs' water, contact your local

Table 2: Suggested water quality standards[1]

	Dutch Standards		Canadian Standards	EPA Standards (Human)
Item	No Risk	Risk	Maximum	Maximum
pH	5-8	< 4 & > 9	.	6.5 - 8.5
Ammonia, ppm	< 1	> 2	.	.
Nitrite (as N), ppm	< 0.1	> 1	10	1
Nitrate (as N), ppm	< 25	> 100	100	10
Chloride, ppm	< 250	> 1,000	.	250
Salt (via Na), ppm	< 1,000	> 2,000	.	.
Iron, ppm	< 0.2	.	.	0.3
Manganese, ppm	< 1	> 2	.	0.05
Sulfate, ppm	< 100	> 250	1,000	500
Calcium, ppm	.	.	1,000	.
Total dissolved solids	.	.	3,000	500

[1]See Fact Sheet ANS 00-811S "Guidelines for Water Quality in Pigs" at https://projects.ncsu.edu/project/swine_extension/publications/factsheets/811s.htm for detailed information and references.
Source: North Carolina State University

Table 1: Water quality measurements determined in pig drinking water samples obtained from 84 commercial swine farms.

Measurement	Minimum	Maximum	Average
pH	4.07	8.06	6.70
Ammonia, ppm	0.00	4.27	0.31
Urea, ppm	0.00	3.41	0.04
Nitrite, ppm	0.00	15.90	0.76
Inorganic nitrogen, ppm	0.01	16.30	1.44
Chloride, ppm	0.00	795.00	43.38
Sodium, ppm	1.99	525.00	51.96
Iron, ppm	0.00	0.84	0.04
Manganese, ppm	0.00	0.64	0.05
Sulfate, ppm	0.18	103.95	10.81
Calcium, ppm	0.31	84.90	20.99
Magnesium, ppm	0.24	62.60	6.05
Total dissolved solids	24	1757	254

Source: North Carolina State University

- Des standards très variables et très larges qui peuvent avoir des effets sur les performances
- pH attention au pH très bas surtout quand l'alcalinité tombe à 0

- Les nitrates se transformeront en nitrates en présence de bactéries à hautes températures. Si vos nitrates sont . 25 ppm vous devrez contrôler les biofilms
- Chlorures intervention à 100 ppm
- Sodium intervention à 100 ppm
- Calculez la balance électrolytique
- Fer prendre action à 1 ppm ou 1000ppb car il surpasse l'immunité innée contre les ferrobactéries comme Salmonella et E coli
- Le manganèse peut interférer avec la chloration
- La dureté peut affecter certains désinfectants. Elle peut aussi interférer avec la balance calcium phosphore de l'aliment
- Les phosphates peuvent indiquer une contamination du puits mais peut provenir des acidifiants à base d'acide phosphorique qui peuvent avoir un effet sur le ratio calcium phosphore

MERCI!

REVUE DE LITTÉRATURE

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