

# EXTRA ANTIBIO RDINARY

## ADVENTURES



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Front cover: **Pierre-Yves Clerson**.

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Superheros



**Nikky Millar**  
**Black Nikky**  
PhD student



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**PantherA**  
Postdoctoral Fellow



**Maud de Lagarde**  
**SpiderMaud**  
Postdoctoral Fellow

Lorem ipsum

Researchers



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**CatCécile**  
Associate professor



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**IronRoy**  
Full professor



**Simon Dufour**  
**Captain Dufour**  
Full professor



**Marie Archambault**  
**Bionic Arch'**  
Full professor



**David Francoz**  
**BatFrancoz**  
Full professor



**Marie-Ève Paradis**  
**Ève**  
Veterinary scientific advisor



**John Fairbrother**  
**AquaBrother**  
Full professor

Support team



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Collaborator



**Ibtissem Doghri**  
Knowledge transfer  
advisor



**Aida Minguez Menendez**  
Knowledge transfer  
advisor

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Many thanks to Pier-Yves Clerson and Catherine Imagine. This comic strip would not have been possible without their ability to illustrate our ideas through drawings.

A special thank you to the management team of the FRQNT **Op+lait** group for providing the financial support for this project.

And thank you dear readers, we hope you enjoyed reading about the different projects of the students from the Faculty of Veterinary Medicine

Maud, Nikky et Ahmad

# MAIN CHARACTERS



Black Nikky



PantherA



SpiderMaud



CatCécile



Iron Roy



Capn Dufour



BionicArch'



BatFrancoz



Ève



AquaBrother

# RESEARCHERS

FEBRUARY 2019

The new regulation with added restrictions governing the use of category 1 antibiotics has been published!

WORKSHOP: JUDICIOUS USE OF ANTIBIOTICS



Why not add a second chapter to our study?

Great idea! You got this IronRoy?

Yep!

We will need to call on other collaborators

It's the perfect opportunity to evaluate the impact of this new regulation

ONE YEAR LATER, MARCH 2020, THE FUNDING IS SECURED, BUT...



LATER

What a nightmare!!!

COVID-19 has reached pandemic proportions and is estimated to cause 4 000 000 deaths this year.

Should we postpone until the end of the pandemic?

The study must begin, but we don't have enough students!

Stop pulling your hair out! You barely have any left!

Let's enlist students that are already here at the FMV!

If we don't do anything,

antibiotic resistance

could kill 10 000 000 people each year by 2050!

We can't quit now!

FINALLY

The future is in YOUR hands

Let me introduce our NEW students!

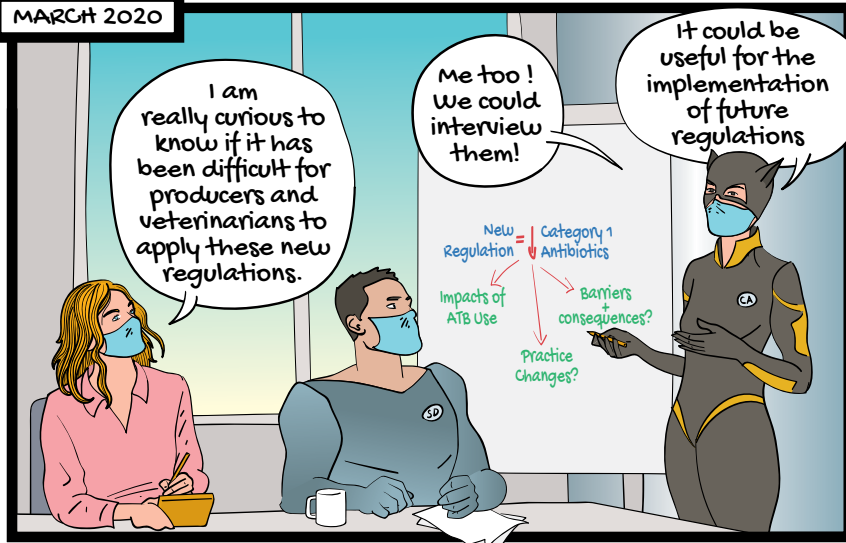
CHALLENGE ACCEPTED!



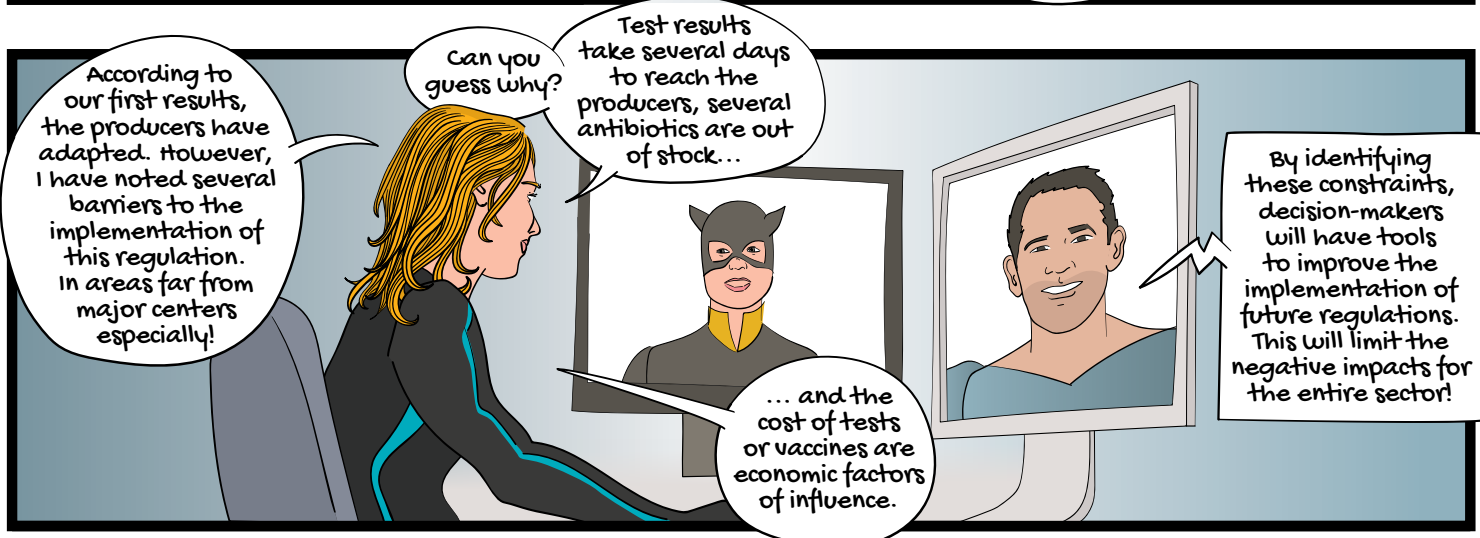
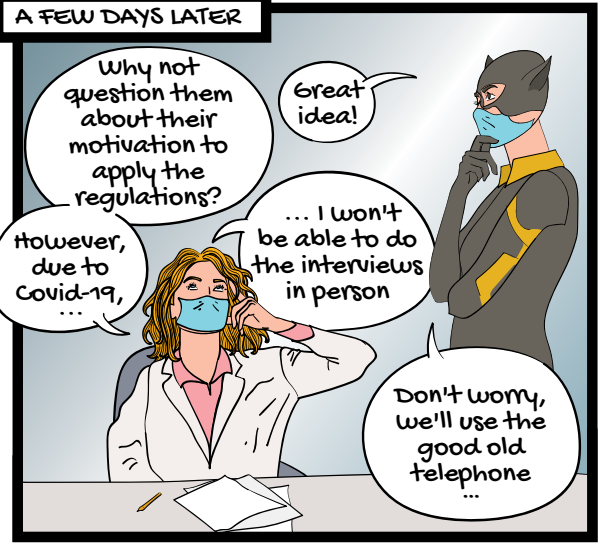


Newly implemented regulations mean disruption of habits. Our superheroes will investigate the impacts for producers and veterinarians. With the help of a new sidekick...

MARCH 2020

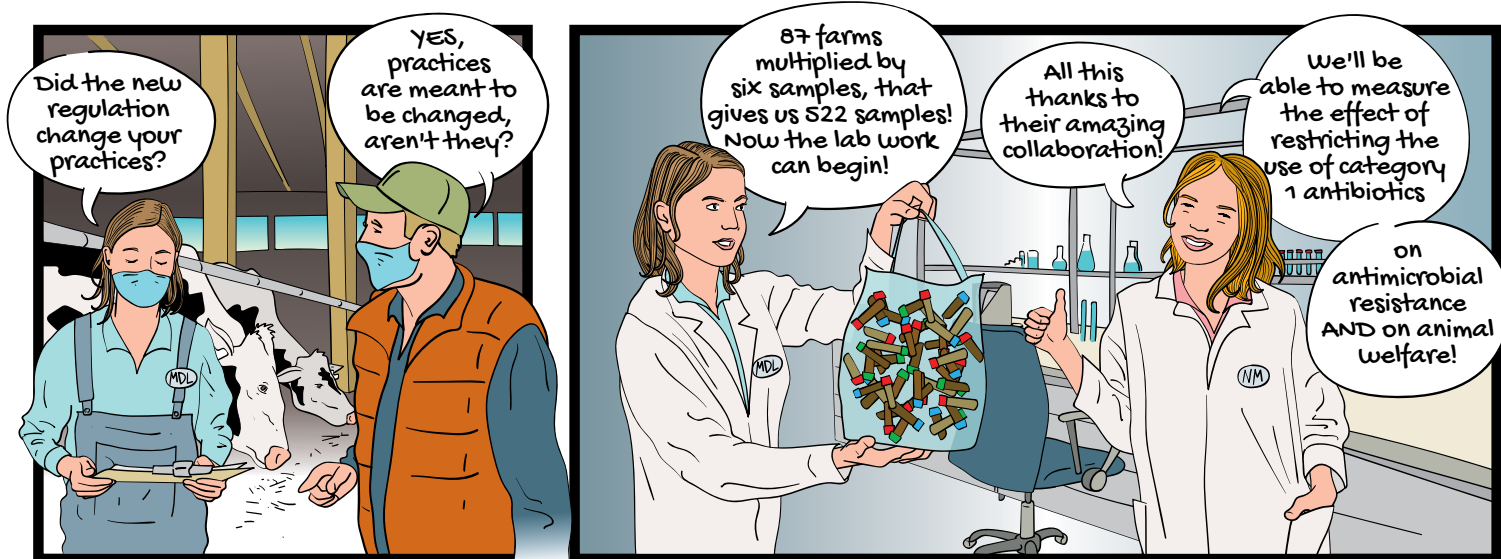
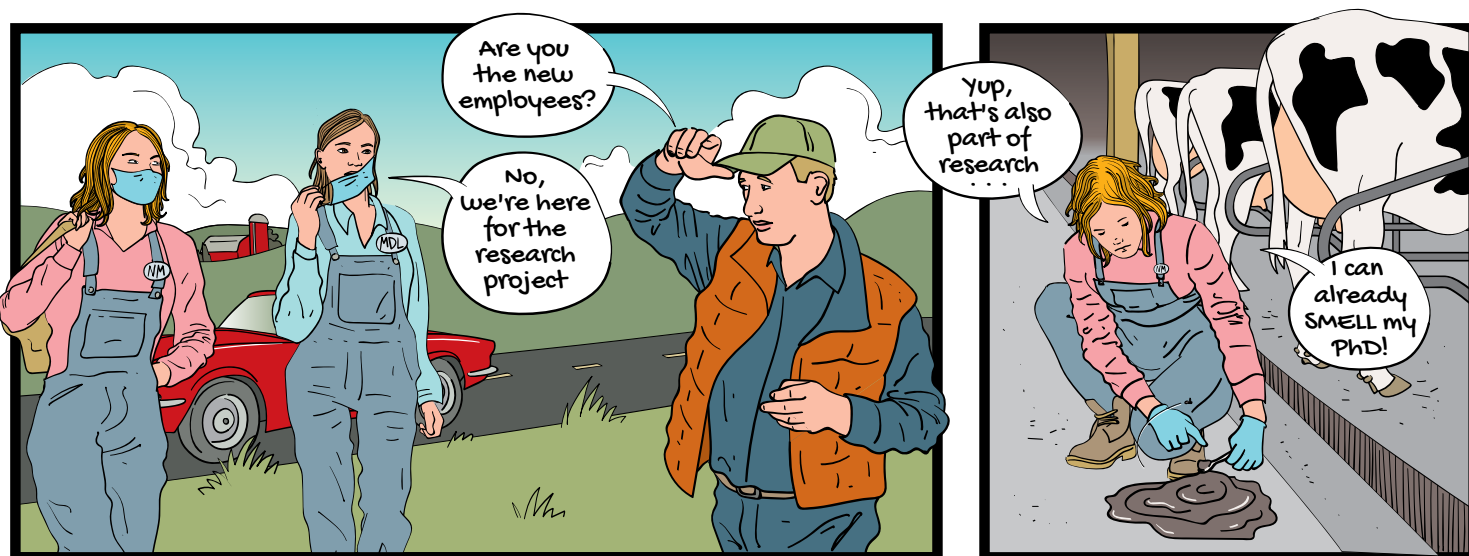


A FEW DAYS LATER



After investigating the acceptability of the regulation with dairy farmers and veterinarians, our superheroes will analyze the impact of the regulation on antimicrobial resistance.

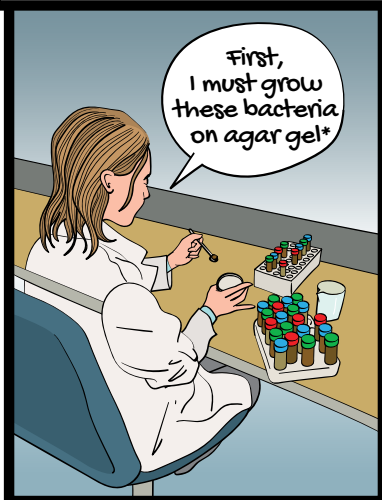
SUMMER 2020





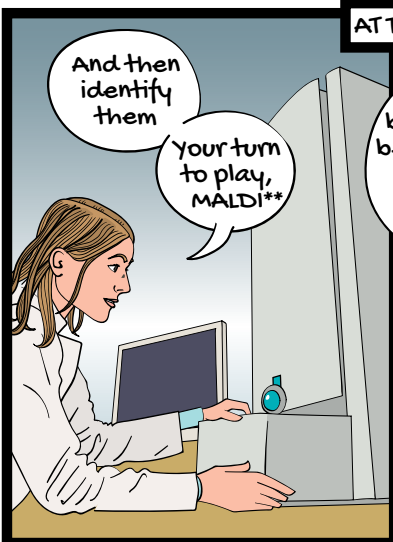
The stool samples have been collected. Lab analysis can now begin.

# SAMPLES HAVE BEEN COLLECTED



First, I must grow these bacteria on agar gel\*

\*Agar is a mat of nutrients that promotes the growth of bacteria

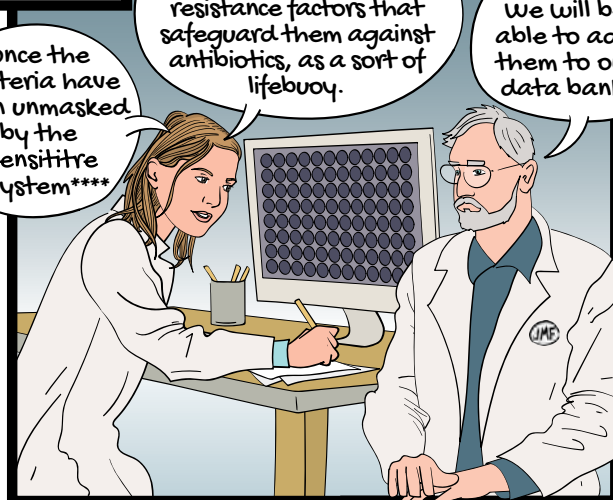


And then identify them

Your turn to play, MALDI\*\*

\*\* MALDI-TOF: State-of-the-art device for identifying bacteria in record time

# AT THE ECL LAB\*\*\*



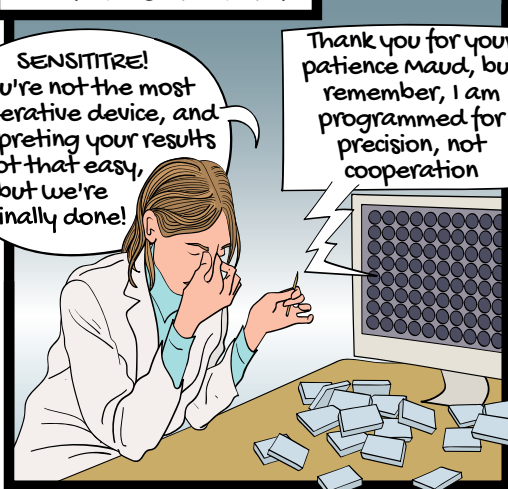
Once the bacteria have been unmasked by the Sensititre System\*\*\*\*

We must determine if the bacteria have resistance factors that safeguard them against antibiotics, as a sort of lifebuoy.

Excellent! We will be able to add them to our data bank!

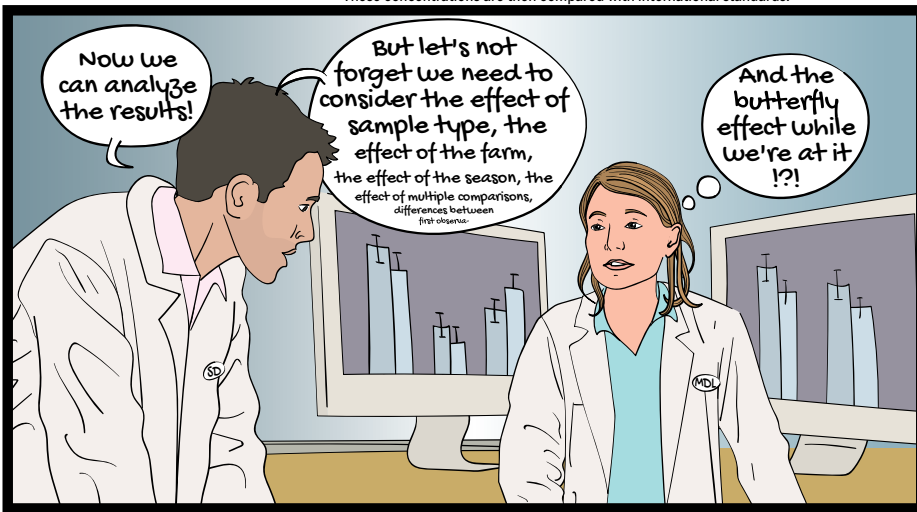
\*\*\* The Ecl lab, headed by Dr Fairbrother, is the OIE reference lab for pathogenic E. coli in animals. It is located at the Centre de diagnostic vétérinaire in Saint-Hyacinthe.  
\*\*\*\* Sensititre : Device for determining antibiotic concentrations that inhibit bacterial growth. These concentrations are then compared with international standards.

# SEVERAL MONTHS LATER



SENSITITRE! You're not the most cooperative device, and interpreting your results is not that easy, but we're finally done!

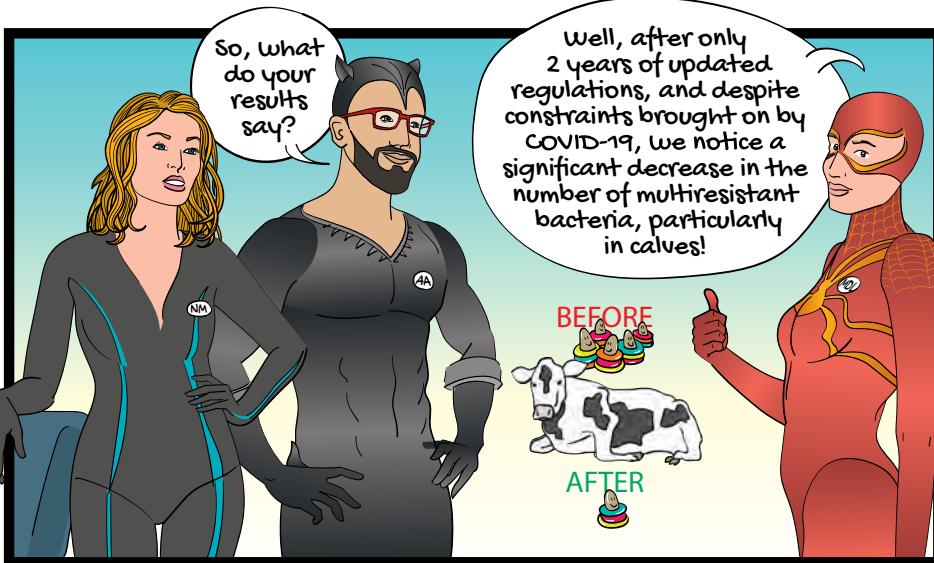
Thank you for your patience Maud, but remember, I am programmed for precision, not cooperation



Now we can analyze the results!

But let's not forget we need to consider the effect of sample type, the effect of the farm, the effect of the season, the effect of multiple comparisons, differences between first observation

And the butterfly effect while we're at it !?!



So, what do your results say?

Well, after only 2 years of updated regulations, and despite constraints brought on by COVID-19, we notice a significant decrease in the number of multiresistant bacteria, particularly in calves!

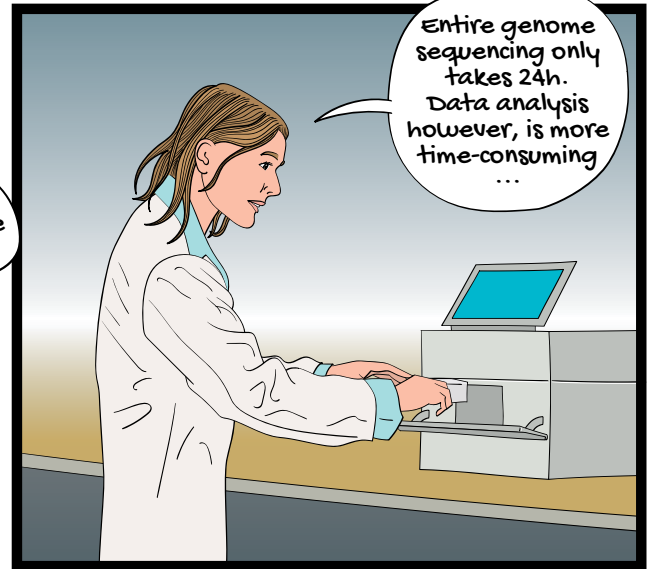
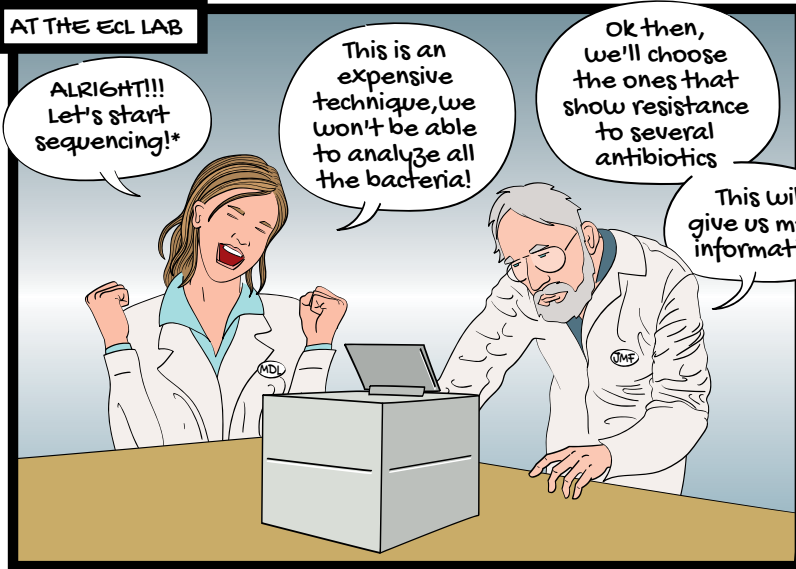


Kudos to the entire sector!

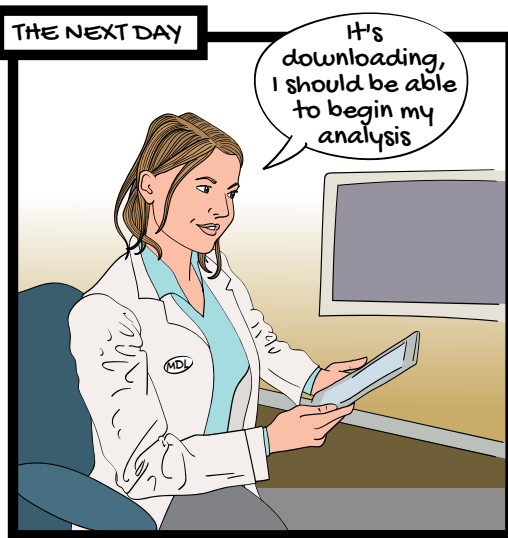
Let's keep up the good work!

Once antibiotic resistance has been tested, our superheroes will examine the bacteria's DNA to find out which elements (more specifically which genes) are responsible for this resistance.

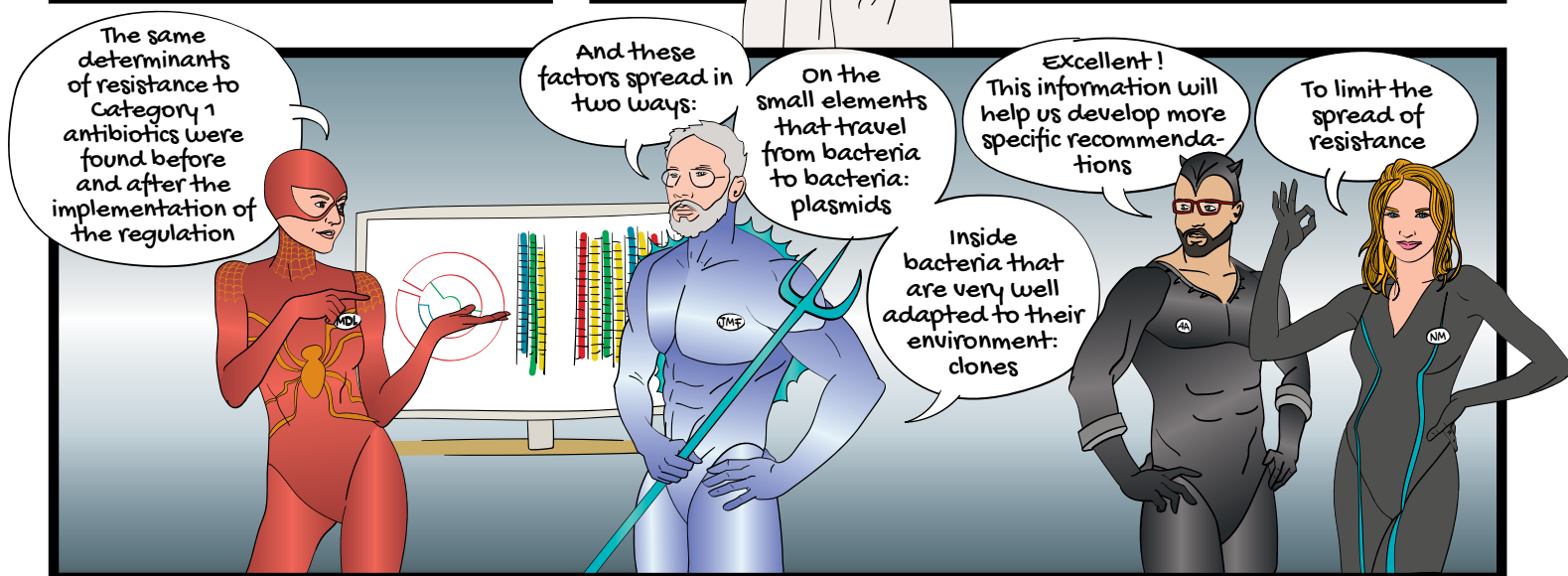
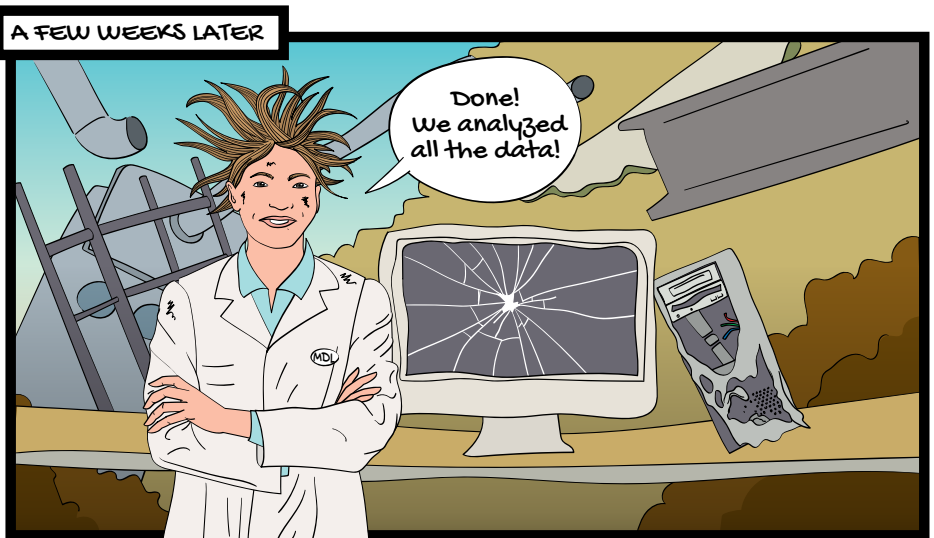
#### AT THE ECL LAB



#### THE NEXT DAY



#### A FEW WEEKS LATER

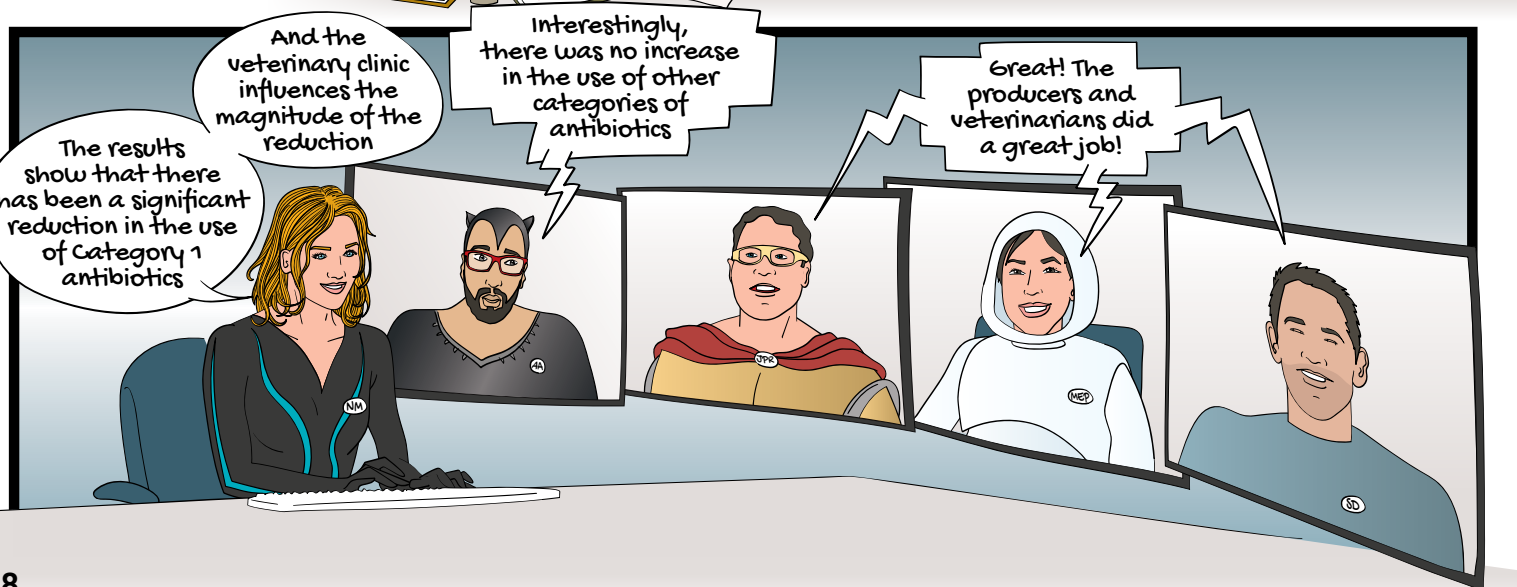
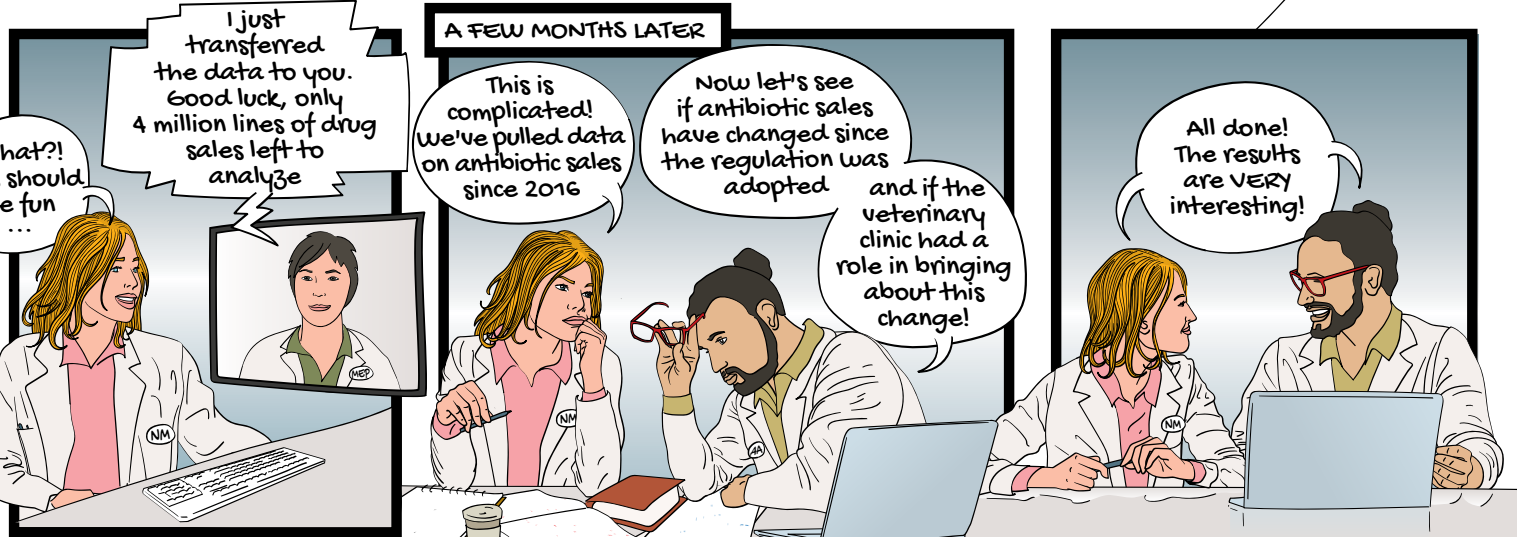
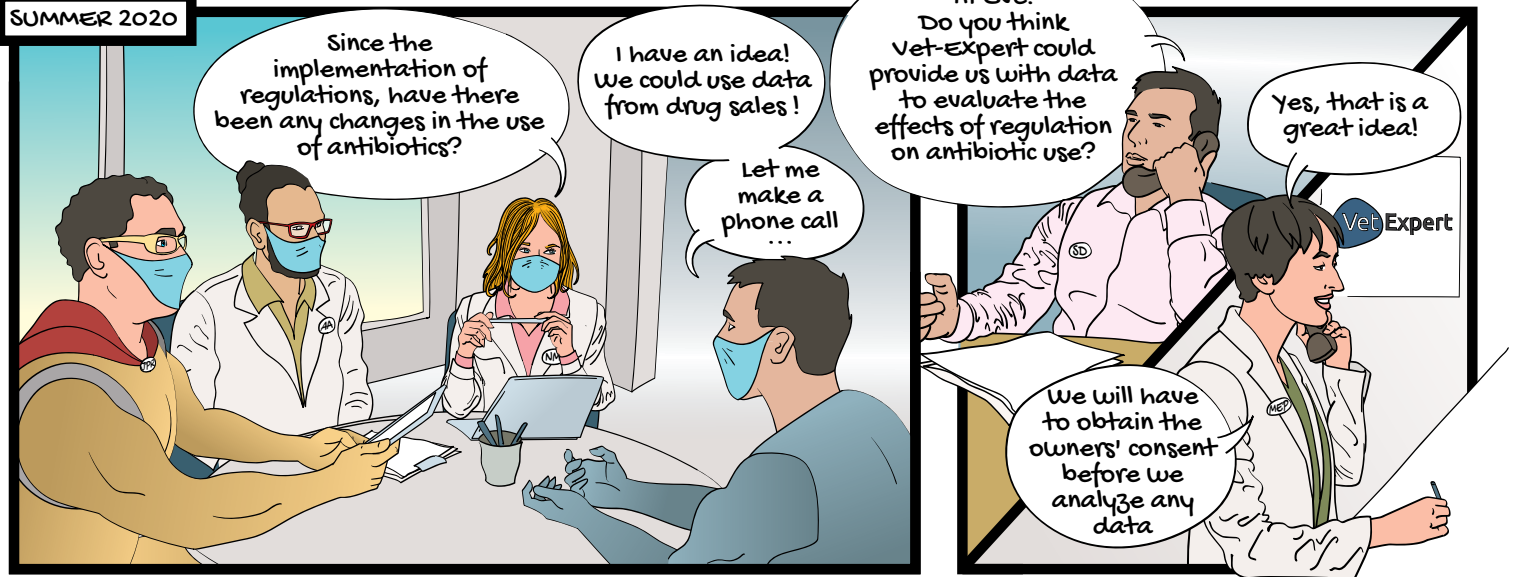


\* Whole genome sequencing is a state-of-the-art technique. It allows us to study the presence of resistance genes and how the genes spread from one bacteria to another.



Our superheroes will now investigate which changes in antibiotic use the regulation may have led the dairy farmers to adopt.

SUMMER 2020



After their efforts to analyze the consequences of regulations on antibiotic use and antibiotic resistance, our superheroes are thinking of developing a data visualization tool that can help dairy producers evaluate their antibiotic use and compare themselves to other producers in Quebec (benchmarking).

