

## SAVING MORE LIVESTOCK, STABILIZING MORE LIVES

How a made-in-Africa vaccine could combat multiple deadly livestock diseases at the same time

POSTED BY ALANNA MITCHELL ON MARCH 26, 2019

The first symptom to strike is a fever, followed by running eyes and snout, like an unrelenting sinus infection. The tongue swells with lesions so painful the animals refuse to eat. The eyes redden. Pneumonia sets in, a misery compounded by diarrhea. In nine out of 10 cases, the infected sheep or goat dies. During outbreaks, their corpses strew the fields.

The disease's common name is goat or sheep plague, depending on which livestock are affected. The Paris-based [World Organisation for Animal Health](#) calls it PPR, which is short for peste des petits ruminants (the scourge of small grazers), and has declared the disease so serious it must be reported to authorities when it breaks out. PPR spreads like wildfire, jumping from animal to animal and then country to country along with the illegal trade and movement of livestock. It doesn't infect humans.

Alarmingly, PPR has begun to spread to new nations more rapidly in recent years. From the first case in Côte d'Ivoire in West Africa in 1942, the virus is now present in more than 70 countries. It has spread to 14 of those just since 2007, finally reaching Georgia, in eastern Europe, three years ago. From that small start nearly eight decades ago, today, approximately 30 million animals get infected each year. Because demand for livestock among low-income farmers is expected to double globally in the next 15 years, the PPR toll could rise.

That's a problem. Sheep and goats often make the difference between eating and going hungry to many of the 300 million low-income families in Africa, Asia and the Middle East that rely on them. It's not just the milk and meat the animals provide, but also wool, skins and manure for crops.

And the animals are often the only safeguard between security and catastrophe. When they fall ill and die, the people who raise them — mainly women farmers in livestock-based rural economies — are often forced to migrate to other communities or countries to find food. Healthy sheep and goats keep families on their own land and in their own culture. And when families can stay put, children have a better shot at going to school.

One simple way to keep livestock healthy is a vaccine. With a single dose, the animal has protection from PPR for life. In 2015, the World Organisation for Animal Health and the [Food and Agriculture Organization of the United Nations](#) launched a campaign to eradicate PPR by 2030. It follows the decades-long effort to eliminate rinderpest, a disease that was a leading cause of death in cattle and domesticated yaks and buffalo until it was declared globally eradicated in 2011. As part of that global effort, [IDRC is supporting](#) the modi-



Sheep are among the millions of livestock around the world that are affected by such diseases as PPR and Rift Valley fever, both of which could be combatted by a new combination vaccine developed in Morocco. (Photo: IDRC)

fication of a PPR vaccine that's already on the market, says Victor Mbaio, an IDRC senior program specialist in Nairobi. The Morocco-based veterinary pharmaceutical company [M.C.I. Santé Animale](#) has already developed a vaccine against PPR as well as pox in both goats and sheep. It's being used in Chad and other West African countries, says Baptiste Dungu, who was the firm's head of strategy business development while the modification was taking place and is now chief executive of Onderstepoort Biological Products SOC Ltd. in South Africa.

The innovation is that M.C.I. has reformulated that vaccine, making it effective against Rift Valley fever as well. Rift Valley fever strikes in waves about seven years apart, infecting livestock as well as humans. It's spread to humans through infected tissue and mosquito bites. An outbreak in Kenya in 2006 and 2007 killed 118 people. Because it attacks so rarely, farmers don't think about routine vaccinations against it, Dungu says. "The PPR global eradication effort gives the opportunity to farmers to get awareness of vaccines and control other diseases."

The next step is for M.C.I.'s partners at the Canadian Food Inspection Agency's National Centre for Foreign Animal Disease in Winnipeg to help test the combination vaccine. After that, it will go into field trials.

Dungu says the main cost of vaccinating animals in most countries is not the product itself, but mobilizing people and vehicles to get the vaccine where it's needed. Making a single dose effective against more diseases is a "no-brainer," he says. "It will make it easier to control several diseases at the same time. That's a big advantage for farmers, but also for countries."

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### READING AS THINKING

1. What are the symptoms of goat or sheep plague (PPR)?

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2. This disease cannot spread to humans, but it can have devastating effects on people. Explain why.

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3. If you were in a situation where you thought an animal was suffering from PPR, what steps could you take to diagnose it and what measures could you take to prevent the spread of the disease?

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4. Why is it important for farmers to report breakouts of this disease to authorities?

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5. Research suggests that in recent years PPR has been spreading from country to country at a faster-than-normal rate. Why do you think that is?

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6. What potential solution to PPR is presented in the story? How do researchers know that this solution is a promising one?

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7. M.C.I. Santé Animale has reformulated an existing PPR vaccine to make it more effective. What is a key advantage of this new formula?

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### EXTEND YOUR GEOGRAPHICAL THINKING

8. Why is it important for disease eradication efforts to be global and for as many farmers as possible to learn about the effectiveness of vaccines?

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9. Many researchers suggest vaccinating smarter, not harder, which means it is more important to vaccinate a certain number of animals in key areas rather than vaccinating all animals everywhere. What would be the benefits to both humans and animals from taking this approach?

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### Think-Pair-Share

#### Think

10. Introduce students to the **inverted pyramid structure** in writing, as well as the concept of **having a good hook and grabbing readers' attention**. Next, tell students they will be writing their own stories about goat and sheep plague. The purpose of these stories is to inform others about this disease based on what the students have learned. Have each student think of a sentence they would use to begin their story about this disease and tell them to write their sentences on a sheet of paper.

#### Pair

11. After they have written their introductory sentences, have students pair up with a partner. Tell each student to pass their papers to their partner. Next, everyone adds a new sentence to the page they were given to continue that story. This process continues for 10 more rounds, so that eventually every story contains 12 sentences, each of which were written by a different student. Prior to the last round, inform students that they will be writing the concluding sentence to the story.

#### Share

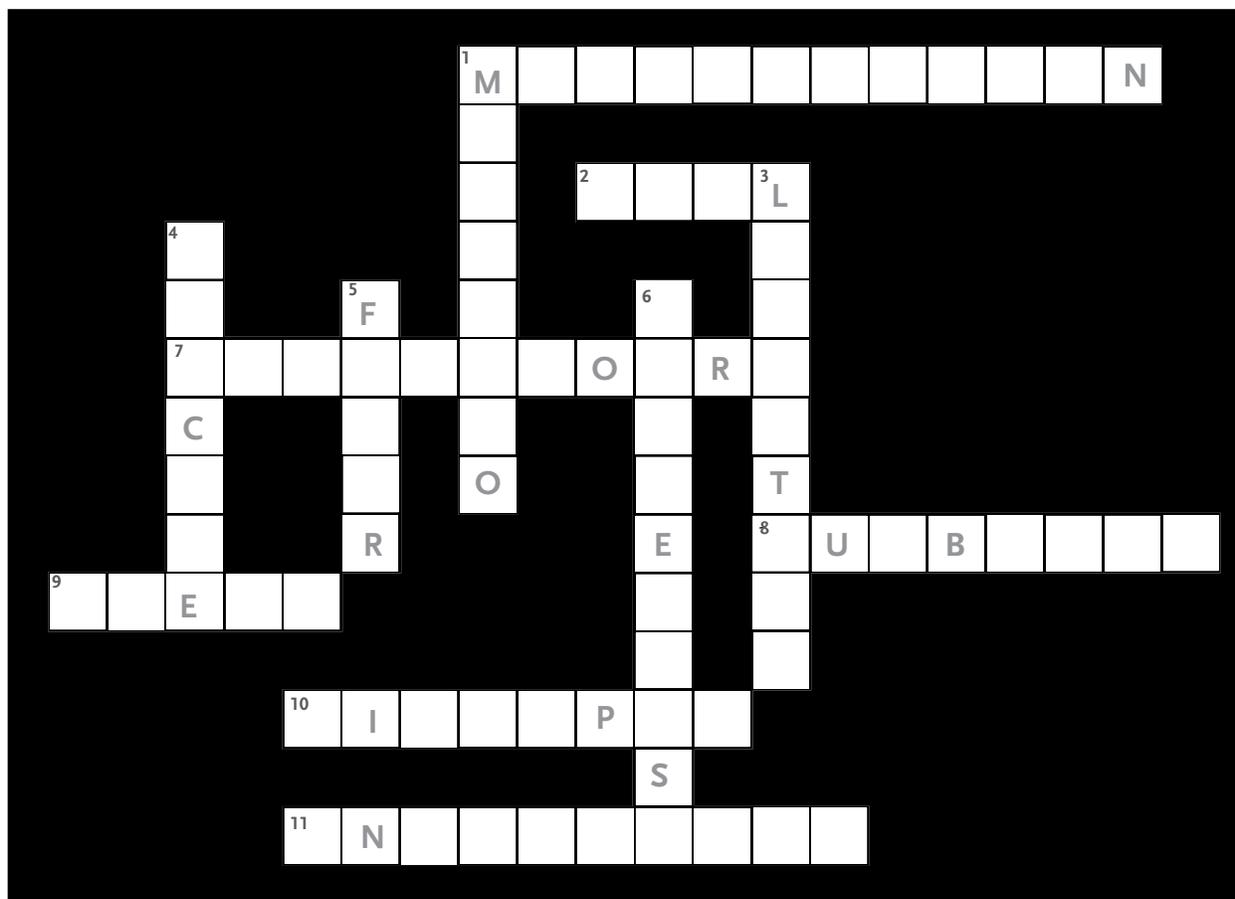
12. Have students share the stories they are holding out loud with the class. Ask the students who wrote the introductory sentences if that is the direction they saw their story taking. As a class, identify common themes and ideas in all the stories, and where the stories have holes or missing information. Research any remaining questions students have so they fully understand the nature and effects of livestock diseases in the developing world.

### ONLINE

1. [Healthy pets, healthy people](#)
2. [Pseudo-rinderpest of small ruminants](#)
3. [Global Control and Eradication of Peste des Petits Ruminants](#)

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### CROSSWORD:

#### Across

1. The main reason for the high cost of vaccinating animals in most countries
2. In many developing countries, goats and sheep are raised for their milk, meat, manure and this
7. The country with the first documented case of PPR (two words)
8. A sudden increase in the occurrences of a disease at a particular time and place
9. One of the two main animals affected by PPR
10. The Canadian city where the National Centre for Foreign Animal Disease is testing combination vaccines
11. The process of creating new methods, ideas and products

#### Down

1. The insect known to spread Rift Valley fever
3. Domesticated animals raised on farms
4. A substance administered to animals to provide immunity against disease
5. When the body reacts to infection or illness by increasing its internal temperature
6. A disease similar to PPR but primarily affecting cattle