Vaccine for Livestock Production Systems

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BACKGROUND

Nontyphoidal *Salmonella* is the largest foodborne-disease burden in the United States, causing the most infections, hospitalizations, and deaths. More than a million cases are reported annually. The economic burden associated with the disease is staggering and encompasses medical costs, food industry costs, and costs to local, state, and federal public health agencies. The health and economic burden associated with *Salmonella* is poised to worsen as multidrug-resistant strains have emerged. These resistant strains are associated with more hospitalizations and can be commonly found in the environment, including in ground water. Additionally, hypervirulent *Salmonella* strains have been isolated from natural microbial populations derived from livestock. These hypervirulent strains are 100-times more virulent than most clinical isolates, are more capable of killing vaccinated animals, and are not detectable under standard laboratory test conditions. *Salmonella* control efforts in livestock face many hurdles including the subclinical nature of the outbreaks, the specific serotypes, environmental persistence, and strain variants. Vaccination represents a sustainable approach to combating *Salmonella* outbreaks, however current conventional vaccines only protect against a narrow range of closely related strains. New vaccines are desperately needed to provide wider coverage.

DESCRIPTION

Researchers at the University of California, Santa Barbara have formulated a live vaccine that protects against *Salmonella* infections in livestock. This modified live *Salmonella dam* mutant vaccine was further modified to contain secondary virulence-attenuating mutations that were used to screen for animal and environmental safety and capacity to confer cross-protective efficacy. The resultant novel vaccine, *Salmonella dam sifA*, exhibits improved vaccine safety, reduced vaccine and challenge strain shedding, reduced environmental persistence, and confers a low-grade persistence in host tissues that is sufficient to confer cross-protection to heterologous pathogenic salmonellae serotypes derived from infected livestock. This new vaccine candidate offers increased safety without compromising cross-protective efficacy and is a safe, effective, and low cost means of oral dosing of livestock via drinking water without significant environmental persistence.

ADVANTAGES

- Improved safety and efficacy
- Easy to administer
- Low cost

APPLICATIONS

- Livestock vaccination

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10329552	06/25/2019	2015-039

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OTHER INFORMATION

KEYWORDS

Salmonella, vaccine, vaccination, livestock, livestock vaccine

CATEGORIZED AS

- **Veterinary**
  - Vaccines

RELATED CASES

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