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# ORAL RABIES VACCINE STUDIES IN THAILAND

Onpawee Sagarasaeranee

Veterinary Officer, Professional level

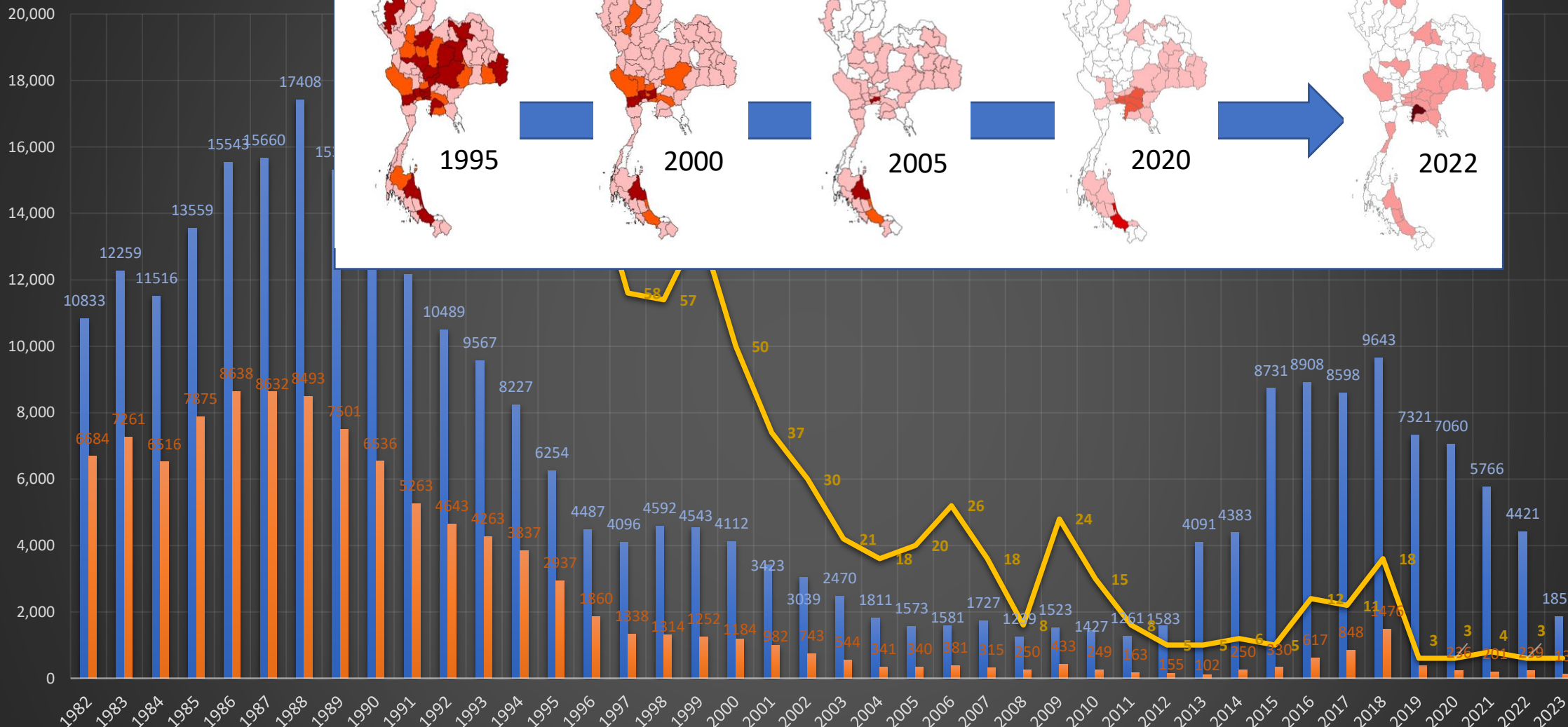
The Bureau of Disease Control and Veterinary Services,

The Department of Livestock Development (DLD)

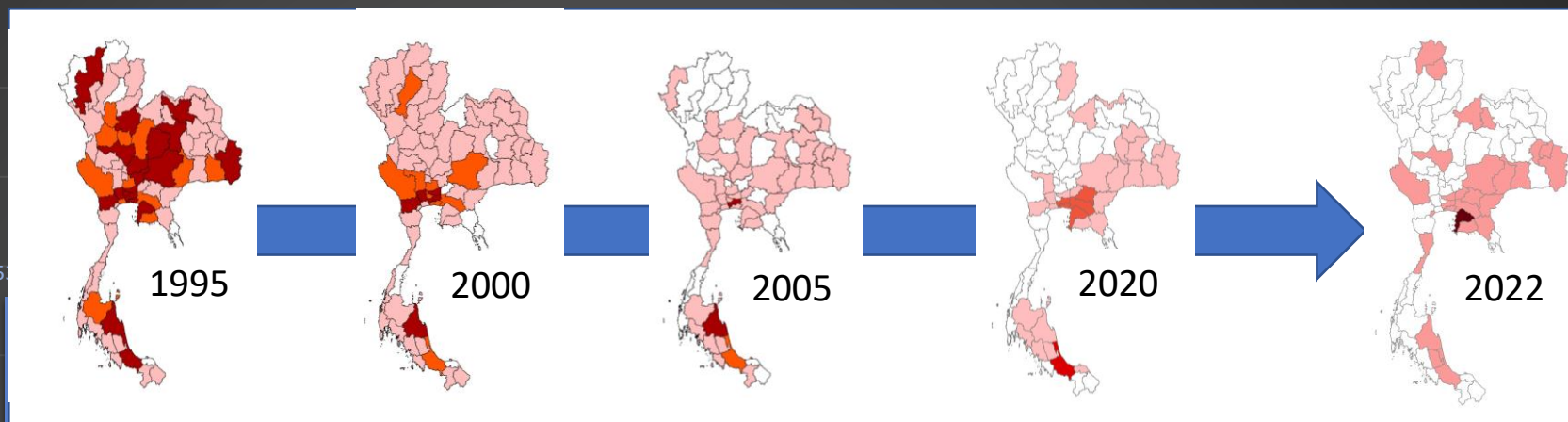
**ASEAN Rabies Consultation Meeting**  
**Revision of the ASEAN Rabies Elimination Strategy**  
2-4 May 2023, Bali Indonesia

# Rabies situation in animal in Thailand

Number of Samples



PERCENTAGE (%)



Number of samples from animals    Number of rabid animals    Number of human death from rabies

# Dog type in Thailand

## Owned dogs



**Owned confined**

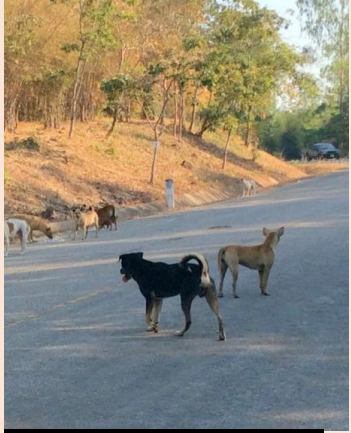


**Owned roaming**

## Strayed dogs



**Community Dogs**

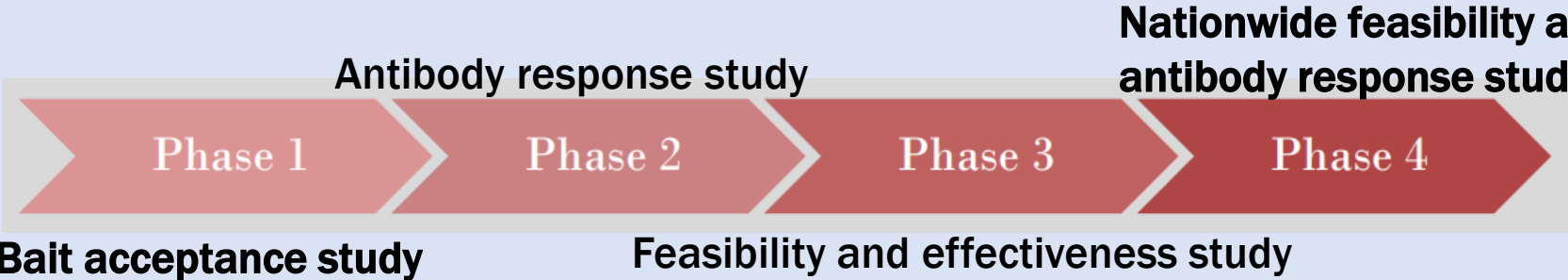


**Wild Dogs**

According to data from year 2016 to 2020

- More than 50% of rabid animals were strayed nor unknown background
- More than 80% of rabid animals were unvaccinated nor unknown history of vaccination (>50% were strayed dog)

**Framework for Oral Rabies Vaccine (ORVS) studies in Thailand**

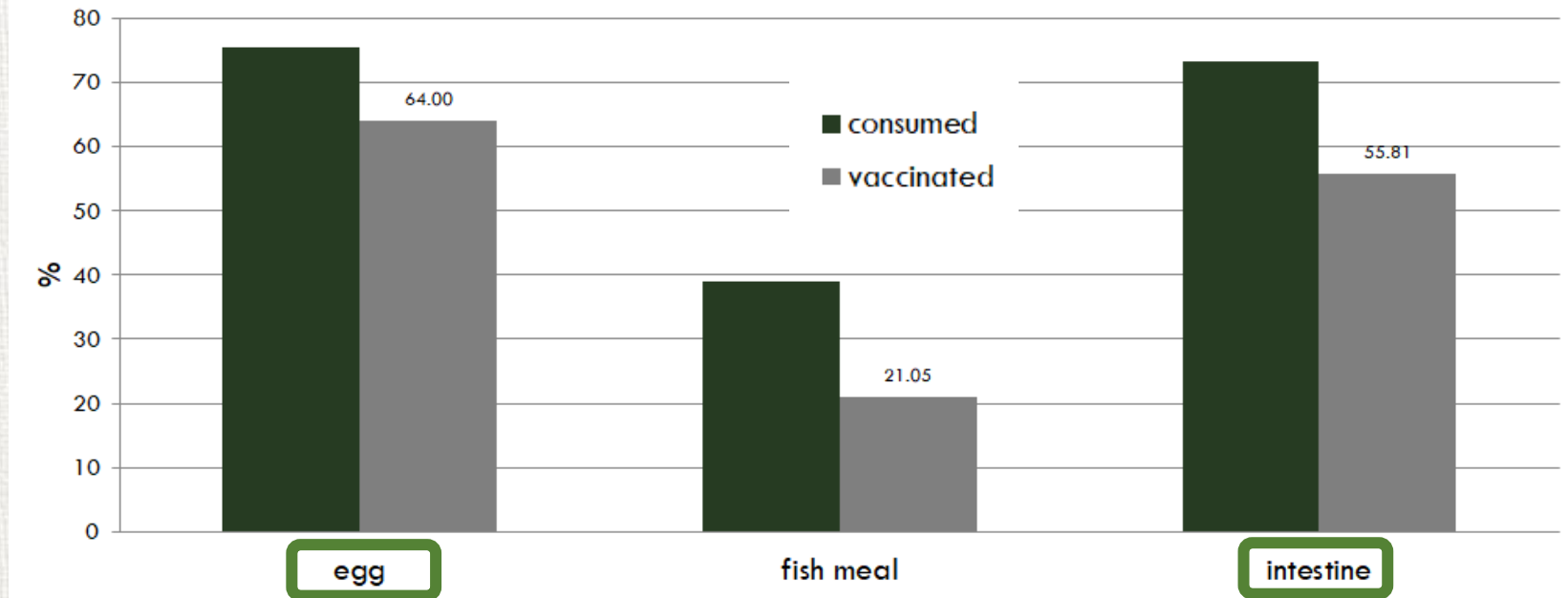
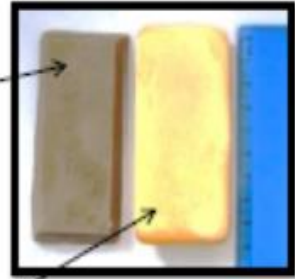


# Phase 1 Bait acceptance study

206 Fishmeal baits  
(brown)

196 Egg-flavored  
baits (yellow)

206 Intestine baits  
(in collagen cases)



@ Free-roaming dogs in Kamphaeng Saen campus of the Kasetsart University, and the surrounding temples in Nakhon Pathom province

- Vaccine delivering (Dye solution) in the oral cavity was more successful in egg-flavored bait.
- The vaccine sachet (Dye solution) was too obvious in the collagen case and some stray dogs in Thailand carefully nibbled the baits.
- Published: Kasemsuwan S, Chanachai K, Pinyopummintr T, Leelalapongsathon K, Sujit K, Vos A. Field Studies Evaluating Bait Acceptance and Handling by Free-Roaming Dogs in Thailand. Vet Sci. 2018;5(2):47. Published 2018 May 4. doi:10.3390/vetsci5020047

# Phase 2 Antibody response study

<b>B</b> Placebo (PBS) withBait	7 dogs
<b>•••</b> RABITEC D/DOA	10 dogs
<b>B</b> RABITEC D/Bait/Blister	15 dogs
<b>📄</b> Bayovac/SC	10 dogs
<b>C</b> Control	4 dogs

D1	D3	D5	D7	D9	D11	D14	D15	D18	D20	D21	D23	D25	D27	D29	D31	D34	D36	D37	D39	D41	D43	D45	D45
📄	•••	📄	📄	📄	📄	📄	📄	📄	📄	B	•••	B	B	B	B	B	B	•••	•••	•••	C	C	C
D2	D4	D6	D8	D10	D12	D13	D16	D17	D19	D22	D24	D26	D28	D30	D32	D33	D35	D38	D40	D42	D44		
B	•••	📄	B	B	B	B	B	B	B	B	•••	B	B	B	B	B	B	•••	•••	•••	C		



ELISA

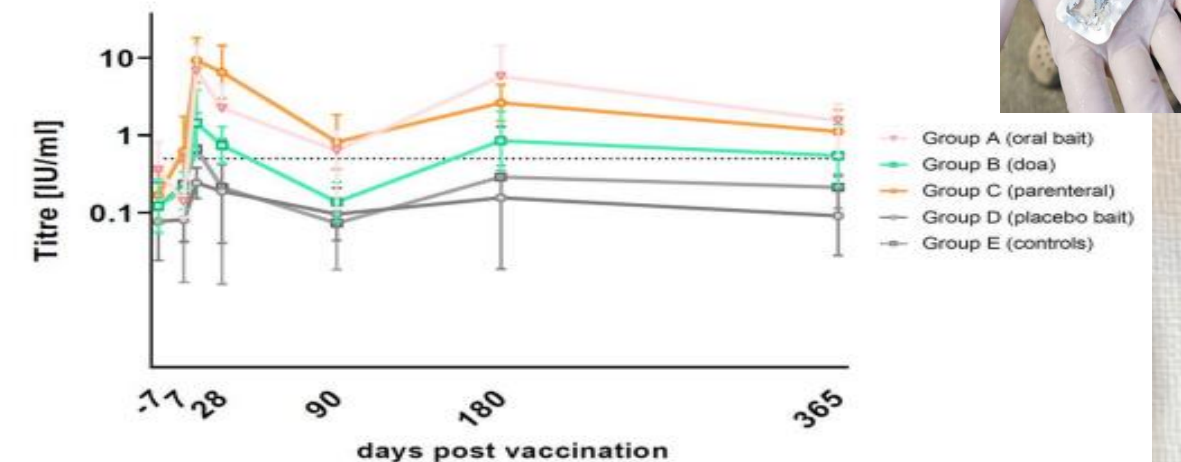
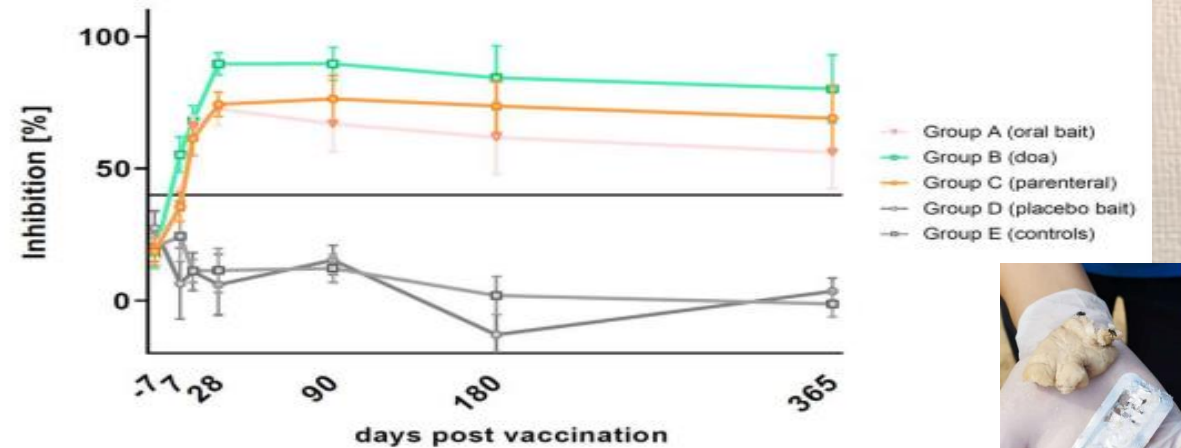


RFFIT

Humoral Immune Response of Thai Dogs after Oral Vaccination against Rabies with the SPBN GASGAS Vaccine Strain

[Kansuda Leelahapongsathon](#),<sup>1</sup> [Suwicha Kasemsuwan](#),<sup>1</sup> [Tanu Pinyopummintr](#),<sup>1</sup> [Orawan Boodde](#),<sup>1</sup> [Parinya Phawaphutayanchai](#),<sup>2</sup> [Nirut Aiyara](#),<sup>2</sup> [Katharina Bobe](#),<sup>3</sup> [Ad Vos](#),<sup>3</sup> [Virginia Friedrichs](#),<sup>4</sup> [Thomas Müller](#),<sup>5,\*</sup> [Conrad M. Freuling](#),<sup>5,\*</sup> and [Karoon Chanachai](#)<sup>6</sup>

- ORV: Live Attenuated rabies virus strain SPBN GASGAS (Ceva Santé Animale, Germany)
- 46 young dogs (26 males and 20 females) at Bangkok Metropolitan Administration's dog shelter in Taptan, Uthai-Thani province



# Phase 3 Feasibility and effectiveness study

## Feasibility and Effectiveness Studies with Oral Vaccination of Free-Roaming Dogs against Rabies in Thailand

Karoon Chanachai<sup>1</sup>, Vilaiporn Wongphruksasoong<sup>2</sup>, Ad Vos<sup>3</sup>, Kansuda Leelahapongsathon<sup>4</sup>, Ratanaporn Tangwangvivat<sup>5</sup>, Onpawee Sagarasaerane<sup>2</sup>, Paisin Lekcharoen<sup>6</sup>, Porathip Trinuson<sup>2</sup>, Suwicha Kasemsuwan<sup>4</sup>



- 83% vaccination success (dogs accepted bait and chewed)
- ORV increased vaccine coverage from 0% to 65.6%

Percentage of dogs interested in bait offered, dogs that chewed very shortly (<10 s), swallowed the sachet and considered vaccinated per bait type offered

Bait Type	No. of Dogs Offered a Vaccine Bait	No. of Dogs Interested in Bait (% [n/N]) *	Sachet Swallowed (% [n/N])	Chewing Time (<10 s) (% [n/N])	Vaccinated ** (% [n/N])
Intestine	1314	92.9 (1209/1302)	80.0 (929/1161)	42.5 (480/1130)	82.0 (995/1214)
Egg	338	87.3 (288/330)	32.2 (88/273)	24.0 (58/242)	83.6 (255/305)
Egg+	278	92.8 (256/276)	26.5 (65/245)	24.6 (60/244)	87.0 (235/270)
total	1930	91.9 (1753/1908)	64.4 (1082/1679)	37.0 (598/1616)	83.0 (1485/1789)

Oral rabies vaccination coverage in the free-roaming dog population in 5 study areas

Study Area	Nr. of Sites	Nr of Inaccessible Dogs	Dogs Approached (% [n/N])	Dogs Accepting the Bait & Successfully Vaccinated (% [m/M])	Vaccination Coverage Achieved (%) *
Choen Noen	59	488	77.5 (378/488)	88.1 (310/352)	68.2
Cha Um	59	789	71.7 (566/789)	79.5 (387/487)	57.0
Phe	112	564	86.5 (488/564)	81.9 (381/465)	70.9
Thong Song	77	456	87.7 (400/456)	81.2 (315/388)	71.2
Tapraya	31	147	66.7 (98/147)	94.9 (92/97)	63.2
Total	338	2444	79.0 (1930/2444)	83.0 (1485/1789)	65.6

\* vaccination coverage achieved (%) was calculated as follows: 100 (n/N \* m/M).

- ORV: Live Attenuated rabies virus strain SPBN GASGAS (Ceva Santé Animale, Germany)
- Egg bait (commercial), pig intestine bait (local made), and Egg+ bait (cat liquid snack pasted on egg bait)

# Phase 4 Nationwide feasibility and antibody response study

\*Incomplete data

\*\*Still on going on lab testing and data analysis



- ORV: Live Attenuated rabies virus strain SPBN GASGAS (Ceva Santé Animale, Germany)
- 12 study areas in all region of Thailand
- Serological monitoring following ORV in 5 study areas

## Serology study

Start with 120 dogs

Provided Microchip ID

Day 0

Day 28

Day 90

Serum collection

Serum collection

Serum collection

Oral rabies vaccination



ELISA test

Successful vaccination

25 dogs (75.76%) from 33 naïve dogs

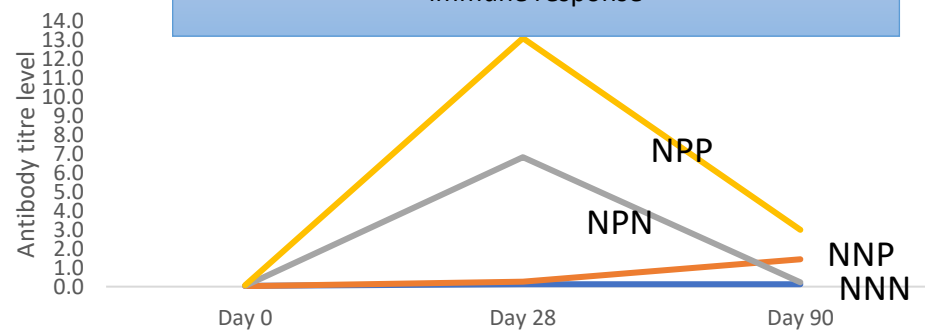
FAVN test

Result D90

Result D28		Negative	Positive	Total
Negative		34 (39%)	7 (8%)	41 (47%)
Positive		16 (18%)	30 (34%)	46 (53%)
	Total	50 (57%)	37 (43%)	87 (100%)

Ownership status	Number of dogs offered a vaccine bait	% of bait consumption (dog chewed vaccine bait)	% of vaccinated (sachet perforation)
Ownerless dogs	1379 (75.8%)	81.9% (1130 / 1379)	93.0% (1020 / 1097)
Owned dogs	338 (18.6%)	70.1% (237 / 338)	98.2% (222 / 226)
Unidentified dogs	103 (5.7%)	65.1% (67 / 103)	93.6% (58 / 62)
<b>Total</b>	<b>1820</b>	<b>78.8%</b> <b>(1434 / 1820)</b>	<b>93.9%</b> <b>(1300 / 1434)</b>

Average of Antibody titer from FAVN divided by group of immune response



12 study areas

# Conclusion

- Stray dogs in Thailand preferred egg and pig intestine bait.
- SPBN GASGAS oral rabies vaccine could induce dog's immune response the same as parenteral vaccine.
- Oral rabies vaccine could improve vaccine coverage in free-roaming dog population in Thailand up to 65%.
- The ORV were feasible to use by staffs in the area with more than 90% of vaccination successful rate.
- It is likely that the booster dose is still necessary at 1 month after first ORV
- Vaccine safety
  - No vaccine-induced adverse effect in captive dogs for 1-year observation period
  - No adverse effects in dogs or humans after ORV campaign





# What to do next?

Key Note of concern:

- The ORV still have not been registered to the Food and Drug Administration (FDA) in Thailand.
- Should we use the ORV as a alternative vaccine in stray dogs without restriction?

**First step:** Restrict the usage → use by DLD Veterinary officer for disease control



Phase 5 The effectiveness of using oral rabies vaccine accompany with parenteral rabies vaccine in endemic areas in Thailand

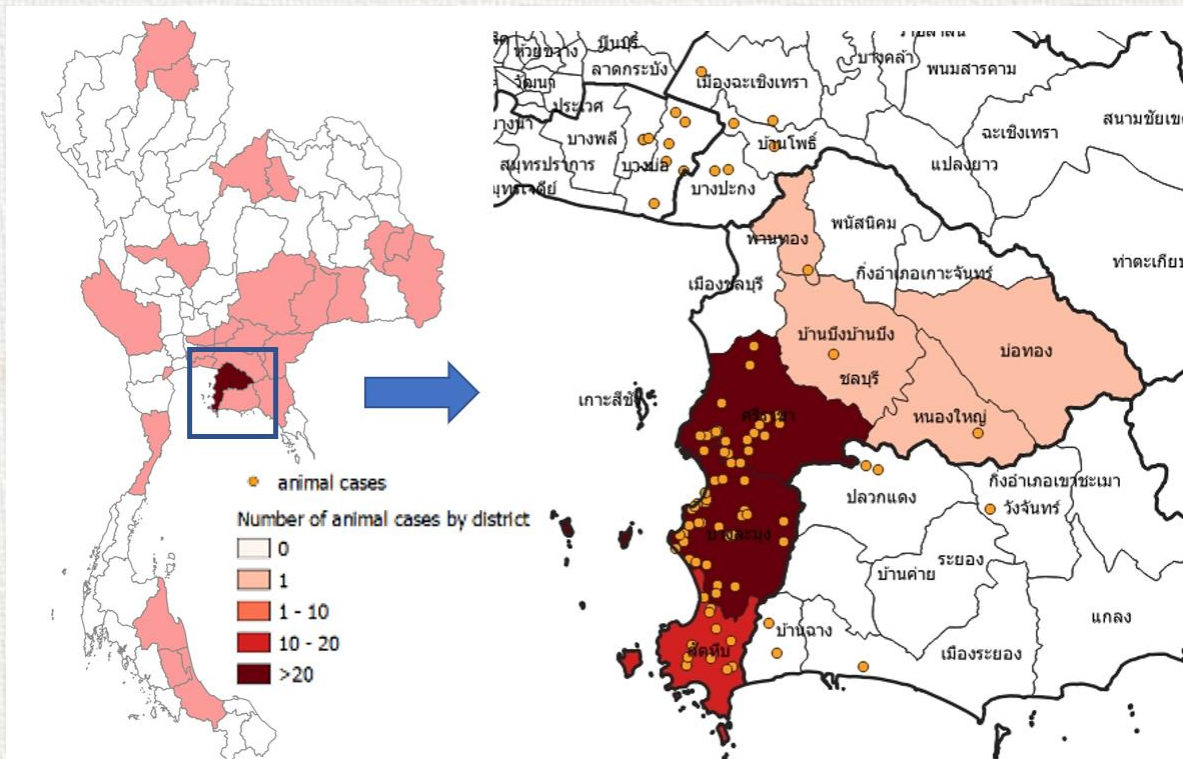
## Objectives

- To use ORVs in high endemic areas in Thailand as alternative rabies vaccine for inaccessible dogs to parenteral vaccination
- To control rabies spreading in high endemic areas in Thailand

➤ Targeted areas are the high-risk area regarding to the previous rabies situation in Thailand

### Chonburi province;

- Bang Lamung District
- Si Racha District
- Sattahip District



# THANK YOU

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## Contact details

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