Experiences of using oral rabies vaccines (ORV) in Thailand

Collaborative project:

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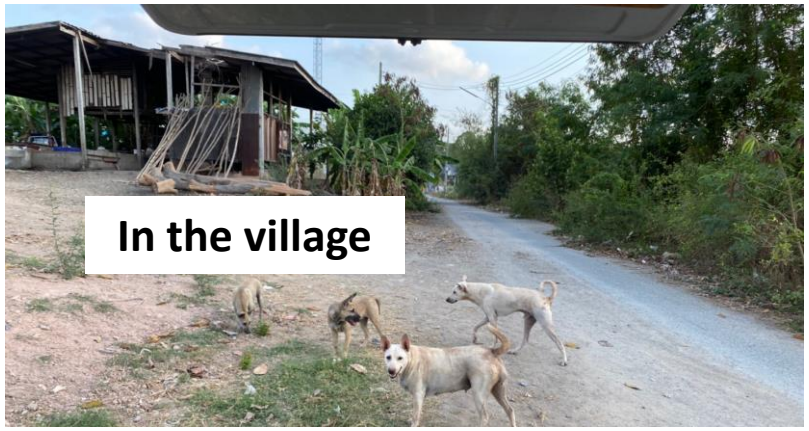
Outline

- Why do we need supplementary tool to vaccinate stray dog?
- ORV project in Thailand
- Lesson learnt and challenge

Temple



In the village

Garbage dumping area

Community owner

Roadside

Stray dog in Thailand

Situation of Animal Rabies in Thailand during 2013-April 2020

Year	Tested sample	Total pos	Pos sample of dog	Pos sample of stray dog (% from total pos)
2013	3,046	90	80	20-25 (22-28%)
2014	3,401	205	189	83-99 (40-48%)
2015	7,192	315	294	119-143 (38-45%)
2016	7,698	572	504	209-257 (37-45%)
2017	7,406	803	704	271-363 (34-45%)
2018	8,558	1,422	1,235	471-594 (33-42%)
2019	5,895	331	267	114-164 (34-50%)
2020 (April)	3,440	82	75	25-48 (30-59%)

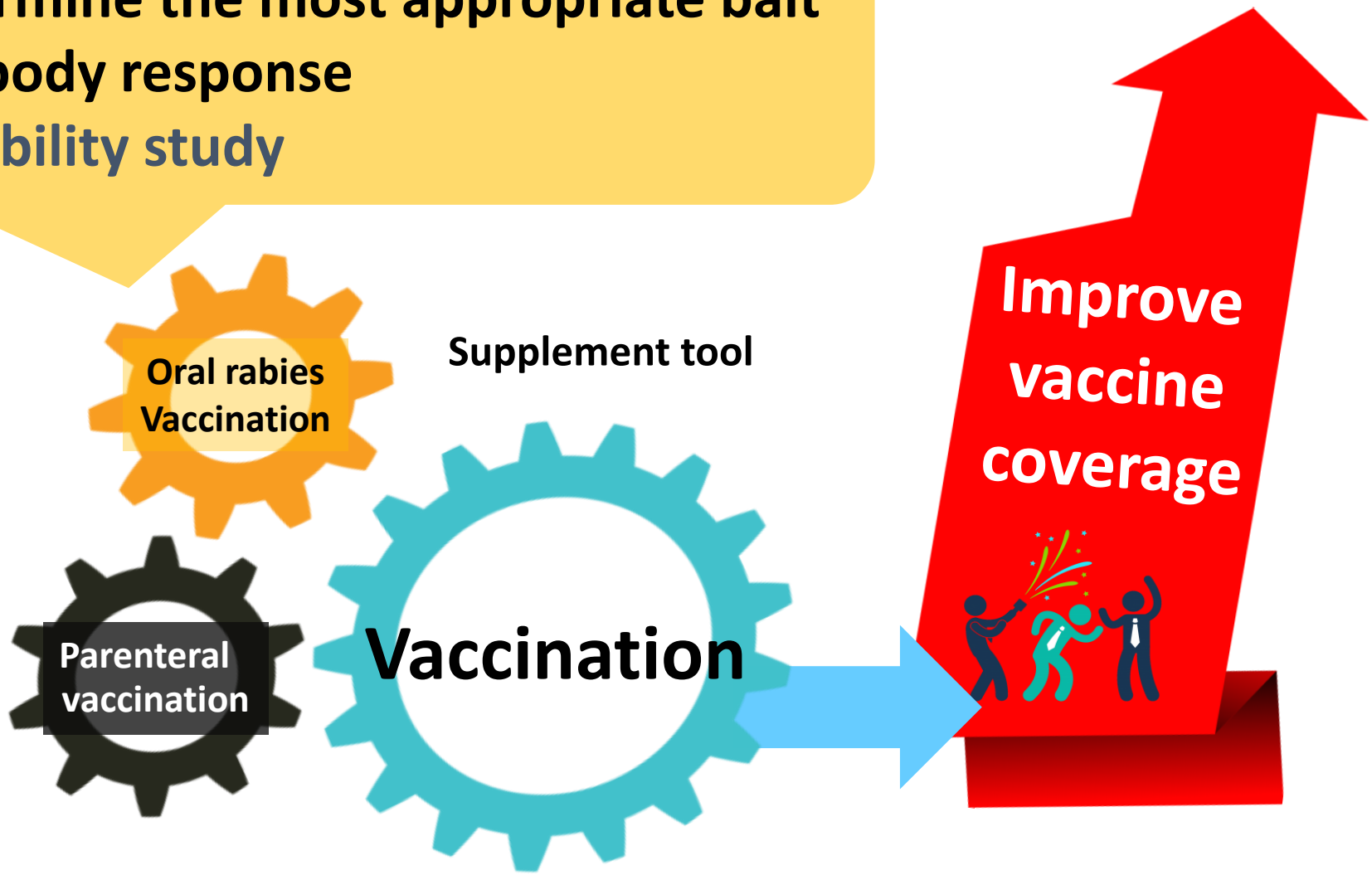
Source: Thai Rabies Net, http://www.thairabies.net/trn/

Oral Rabies Vaccine in Domestic Animal

- OIE terrestrial 2018, Chapter 2.1.17
  - **Countries should assess the need for both ORV of dogs and parenteral vaccination in their rabies control strategy.**
  - Apart from mass parenteral vaccination (carried out concurrently or sequentially), the use of oral vaccination, especially in free-roaming and inaccessible dogs, taking into account structure and accessibility of the dog population, should represent **a complementary measure** for the improvement of the overall vaccination coverage in dog rabies control programmes.
  - For ORV of dogs, **the handout and retrieve** model should be used.

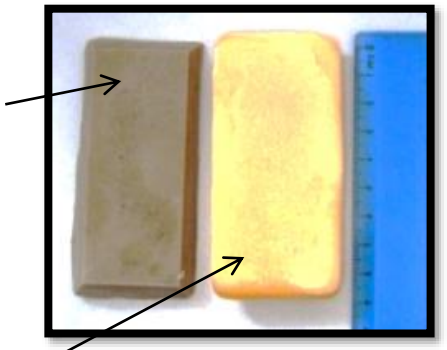
Framework for ORV study in Thailand

1. **Determine the most appropriate bait**
2. **Antibody response**
3. **Feasibility study**

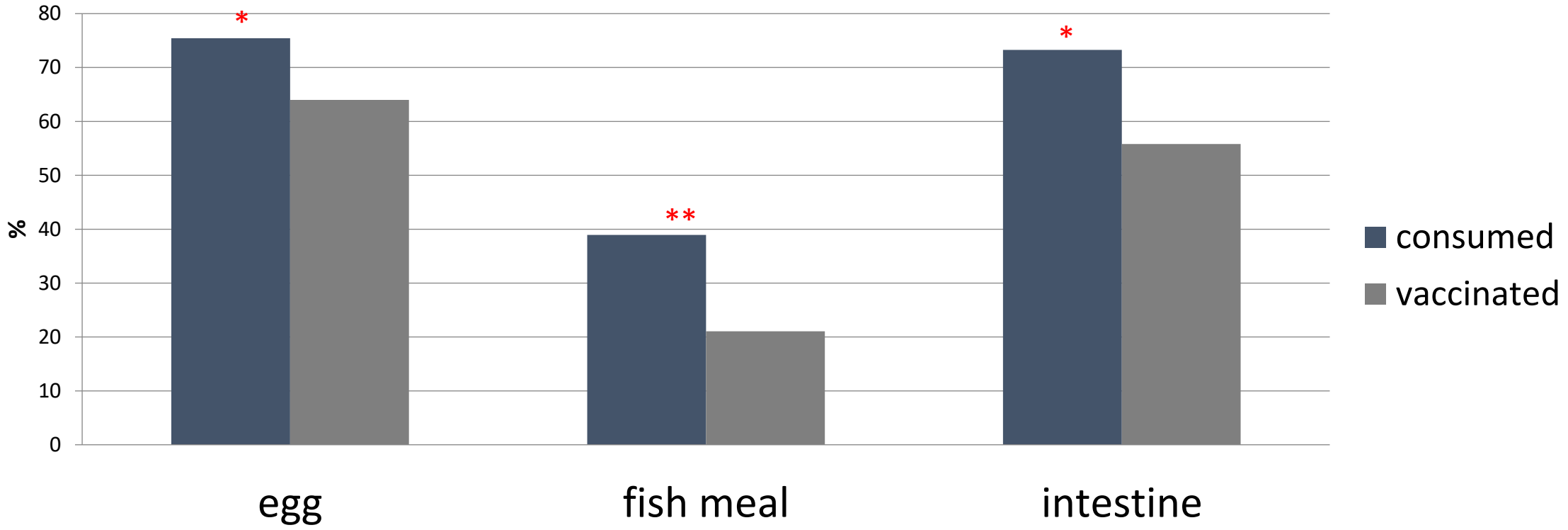


Phase 1 Bait acceptance study

- 206 Fishmeal baits (brown)
- 196 Egg-flavored baits (yellow)
- 206 Intestine baits (in collagen cases)



The percentage of dogs consuming bait type and were subsequently considered vaccinated

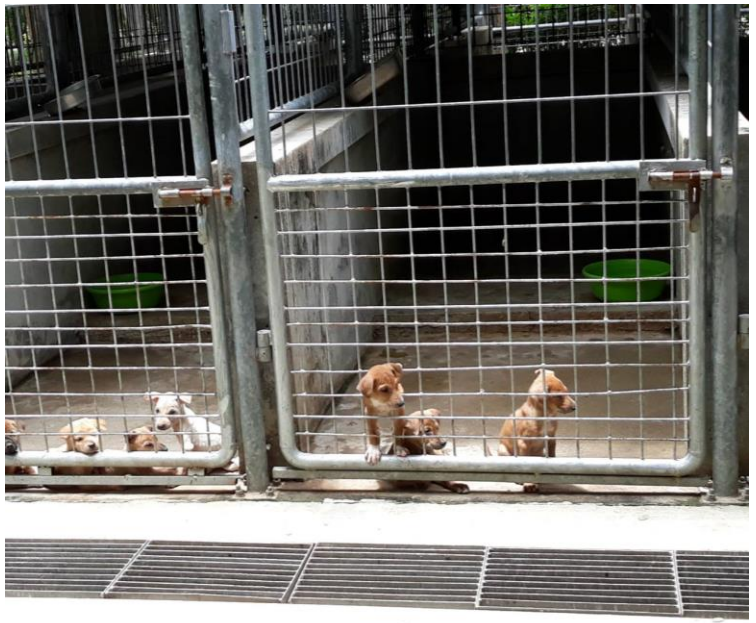


- More successful in egg-favored bait.
- The vaccine blister was too obvious in the collagen case
- Some stray dogs carefully nibbled the baits.
- “vaccinated” means release of liquid from the sachet in the oral cavity

Phase 2 Serological study

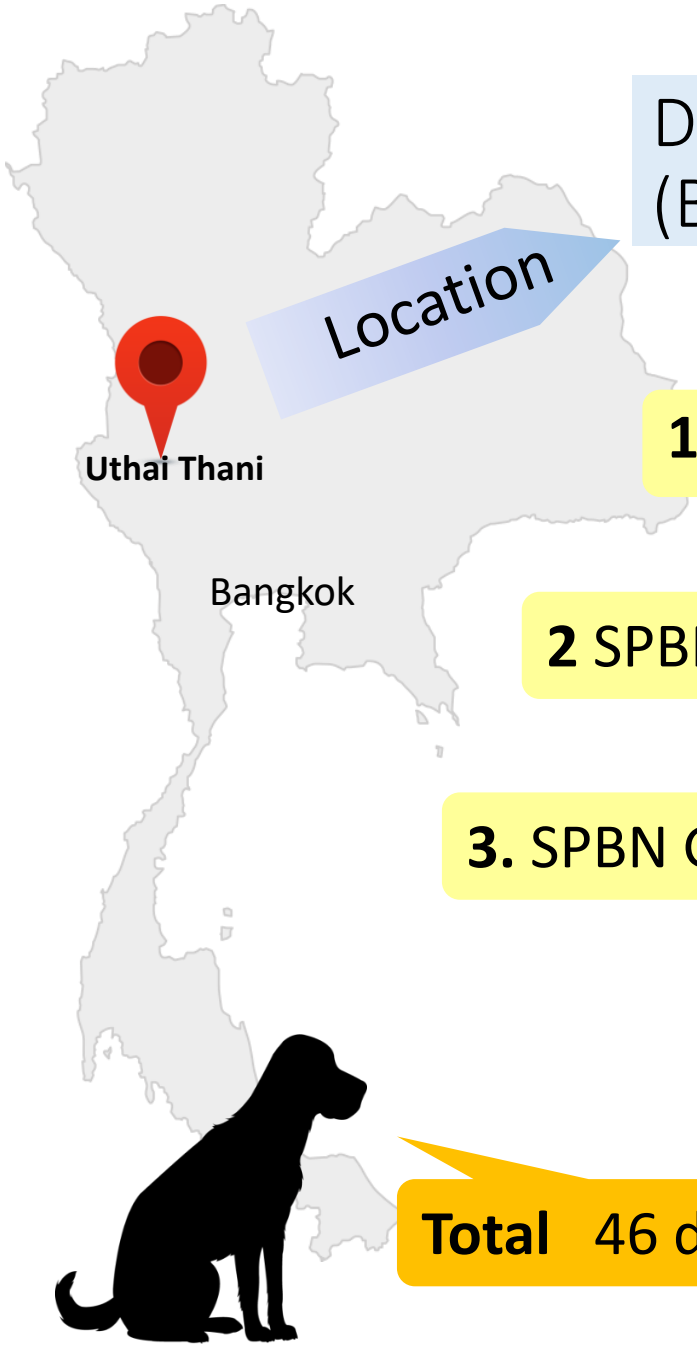
Objective: determine antibody response after ORV in shelter dog.

Vaccine：Live Attenuated rabies virus strain SPBN GAS-GAS, Ceva Sante Animale



- Bangkok Metropolitan Administration shelter
- Newborn puppies accumulated for 1 year
- Experimental dogs aged between 5-12 mts

Dog shelter in Taptan, Uthai Thani (Bangkok Metropolitan administration)



1. Placebo: pig intestine = 7 dogs

2 SPBN GASGAS/Direct Oral Administration (DOA) = 10 dogs

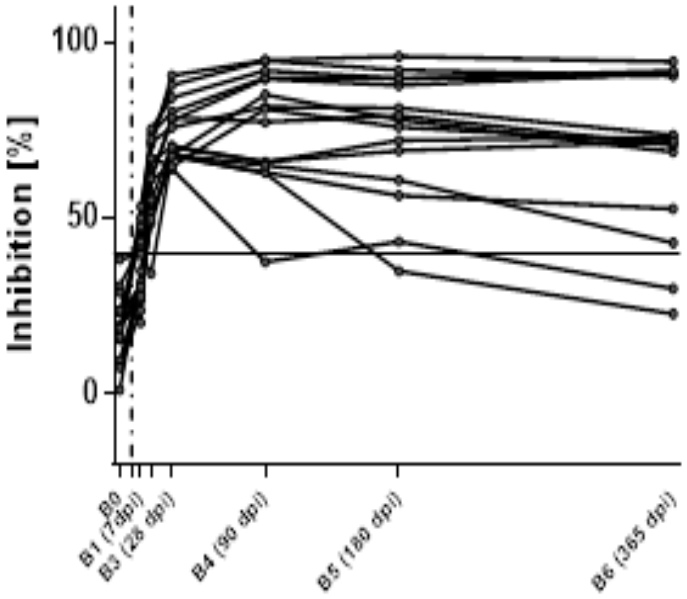
3. SPBN GASGAS /pig intestine vaccine bait = 15 dogs

4. Parenteral (subcutaneous injection) = 10 dogs

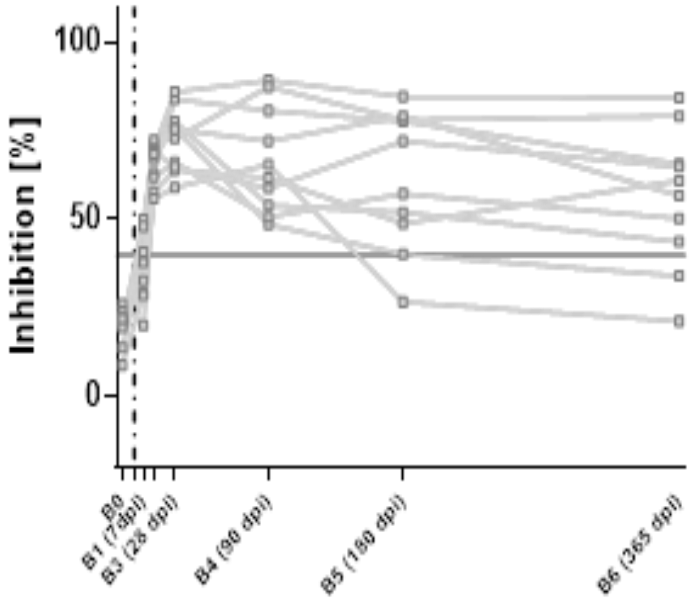
Total 46 dogs

5. Control = 4 dogs

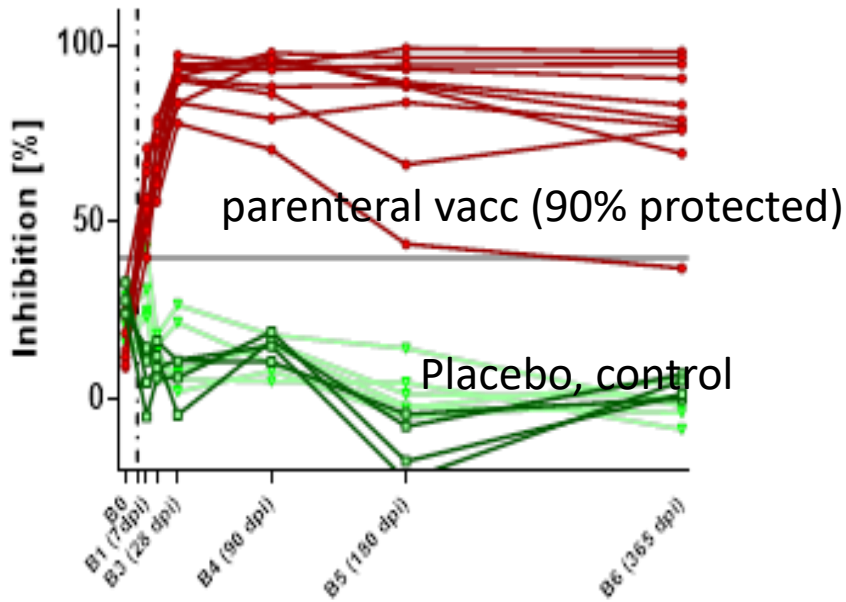
Serological result of individual dog D0 to 365 DPI (ELISA)



Oral Vacc: pig intestine vaccine bait
87% of dogs had antibody titer
above protective level



Oral vacc: DOA
80% of dogs had antibody titer
above protective level



Placebo, control and
parenteral vacc

Note:

1. 40% inhibition is the cut-off for sero-positivity
2. Serological test was performed at Institute of Molecular Virology and Cell Biology, Friedrich-Loeffler-Institute, Germany

Phase 3: feasibility study

To evaluate vaccine delivering method, effectiveness, scalability and sustainability of ORV as a complementary tool to mass dog vaccination by the parenteral route in selected areas.

Process for the feasibility study

- Vaccine importation (SPBN GAS-GAS, Ceva Sante Animale)
- Bait selection and preparation
  - Pig intestine (local made)
  - Egg-flavored bait
- Cooperation with local agencies in planning process
- Educate local people
- Vaccination and follow up: hand-on model
- Summary of vaccination campaign result
- Follow up after vaccination

* All person who handle the oral vaccine were pre-exposure vaccinated

Targeted areas

4 Municipalities

- **Problem on stray dog population**
- **Willing to participate in the project**

The study had been conducted in March at Choeng Noen Sub-district Municipality, Rayong province before COVID-19 crisis in Thailand

Egg-flavored bait

Vaccine sachet

Bait preparation
(pig intestine)

pig intestine vaccine bait

Bait selection and preparation

4) Collecting vaccine sachet

1) Training

3) Observing

2) Delivering

2) Delivering

2 team, 3-4 member per team, 4 working days

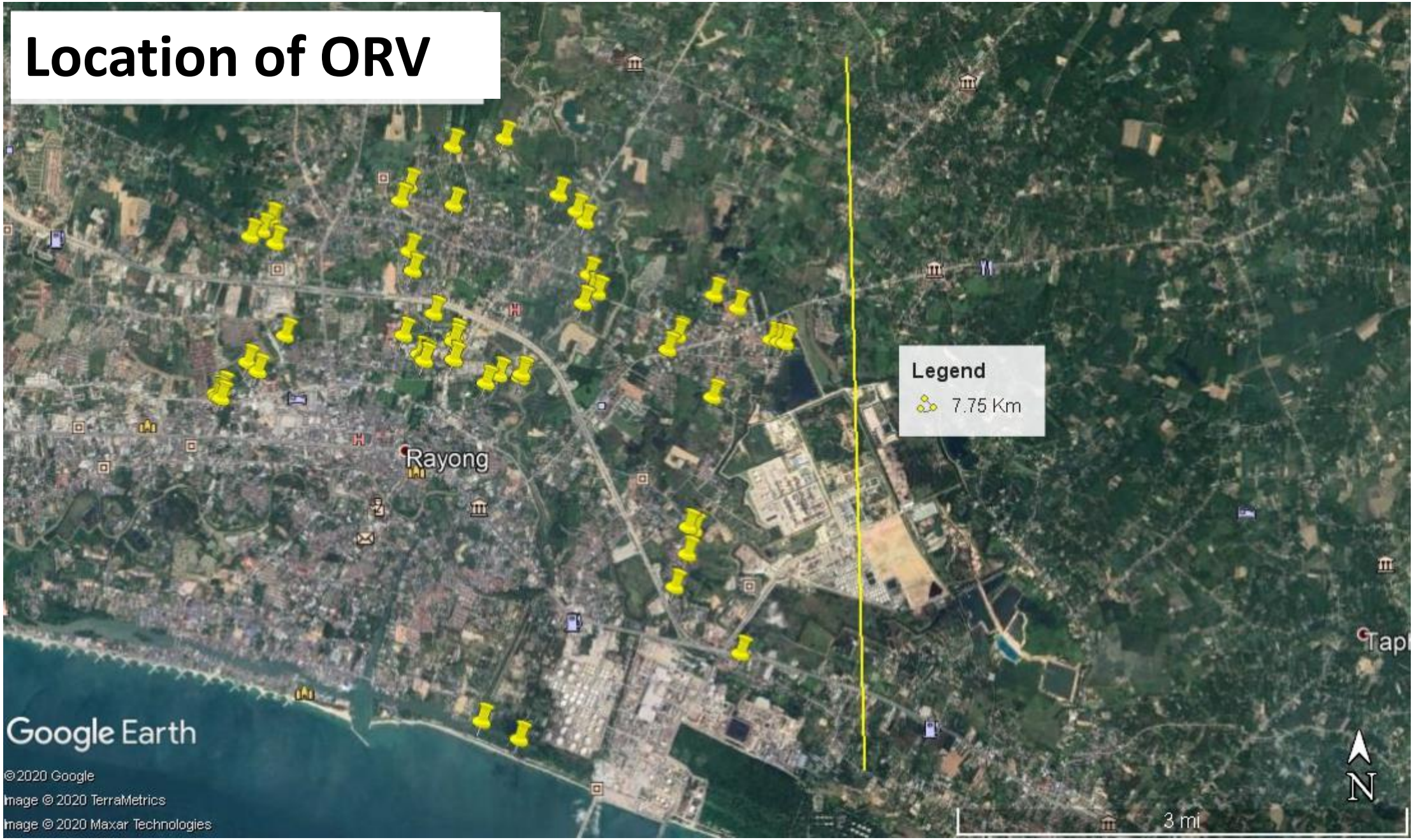
Tentative Result: successfulness of the vaccination

Bait type	No.	% Knowing status of vaccination result*	% successfulness of vaccination**
Pig intestine	260	98% (256/260)	84% (216/256)
Egg flavor	101	91% (92/101)	84% (77/92)
Mix (Egg-flavored covered with pig intestine)	17	100% (17/17)	100% (17/17)
Overall	378	97% (365/378)	85% (310/365)

* **Unknown status of vaccination result** means dogs ran away or can not be observed

** **Successfulness of vaccination** means 1) perforation of vaccine sachet or 2) chewing of bait more than or equal 5 times

Location of ORV



Tentative Result: Oral Vaccination Coverage

Type of location	**Number of location**	**Median number of dog (min-max) per location**	
		Stray dogs	Oral vaccination coverage (%)
Village	43	5 (1-33)	55 (0-100)
Main roadside	6	5 (2-13)	40 (25-100)
Temple	5	21 (2-31)	57 (14-100)
Beachside	2	3.5 (2-5)	80 (60-100)
Other	3	14 (6-16)	50 (31-64)
Overall	59	5 (1-33)	50 (0-100)

Some significant results

- Human contact 0.3% (1/333 time)
  - Try to gave vaccine to young dog
- Vaccine contacted by non-target species 0% (0/332)
- Number of oral vaccination dose consumed by the dog
  - 1 dose 91% (257/283)
  - 2 doses 8% (23/283)
  - 3 doses 1% (3/283)
- No rabies-like symptoms in all dogs – follow up call to focal person in each location (2 weeks after)

Lesson Learnt

- ORV
  - Good antibody response demonstrated in serological study in stray dog
  - Increase vaccination coverage in stray dog demonstrated in feasibility study
- Close engagement with all partners is the key
  - animal health and public health authorities,
  - university,
  - Non-governmental organization,
  - local administrative organization and
  - expert and vaccine provider

Challenges

- Improving oral vaccination coverage by
  - Cooperate with community dog caretaker and
  - Local parenteral vaccinator,
  - Shall improve when the teams obtain more experience approaching the dogs and offering the baits.
- Go through some processes
  - connect with vaccine provider and expert,
  - planning,
  - import vaccine,
  - Implementing the plan,
  - advocacy and **integrate ORV in national rabies vaccination program**

Thank you

Special Thanks for Ad Vos, CEVA Company in presentation preparation