

14th CDTI - NEDO Joint Workshop
“Food Technology”
May 27, 2026 Bilbao (Spain)



SUSTAINABLE BIOTECHNOLOGY
WITH SILKWORMS

FUKUTOMI TAKUYA
R&D, QUALITY CONTROL
KAICO Ltd.



What is KAICO





About KAICO

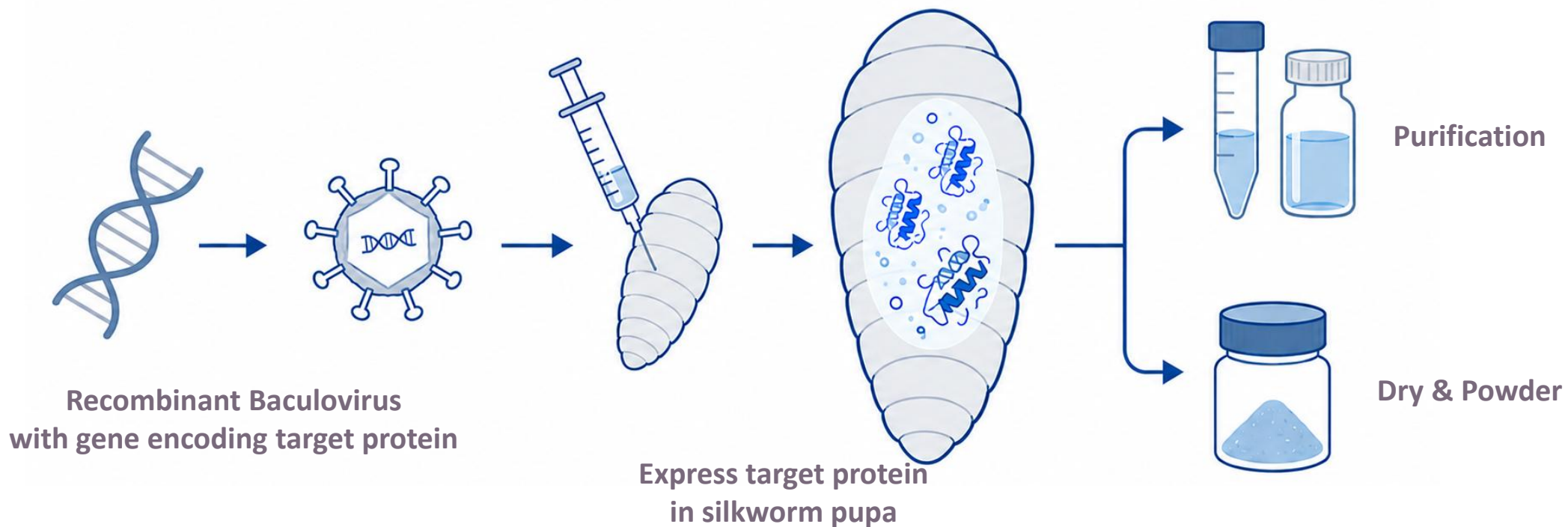
| | | | |
|--------------------------|--|---|---|
| Company | KAICO Ltd. |  |  |
| Established | April 2, 2018 | | |
| Location | Fukuoka in Japan | | |
| Employee's number | 30 (as of 04/2026) | | |
| Business scope | <ol style="list-style-type: none">1. Contract protein expression services2. Manufacture feed additives3. Development of oral vaccines for human and animal4. sale reagents and supplement | | |



Silkworm × BEVS = Natural Bioreactor

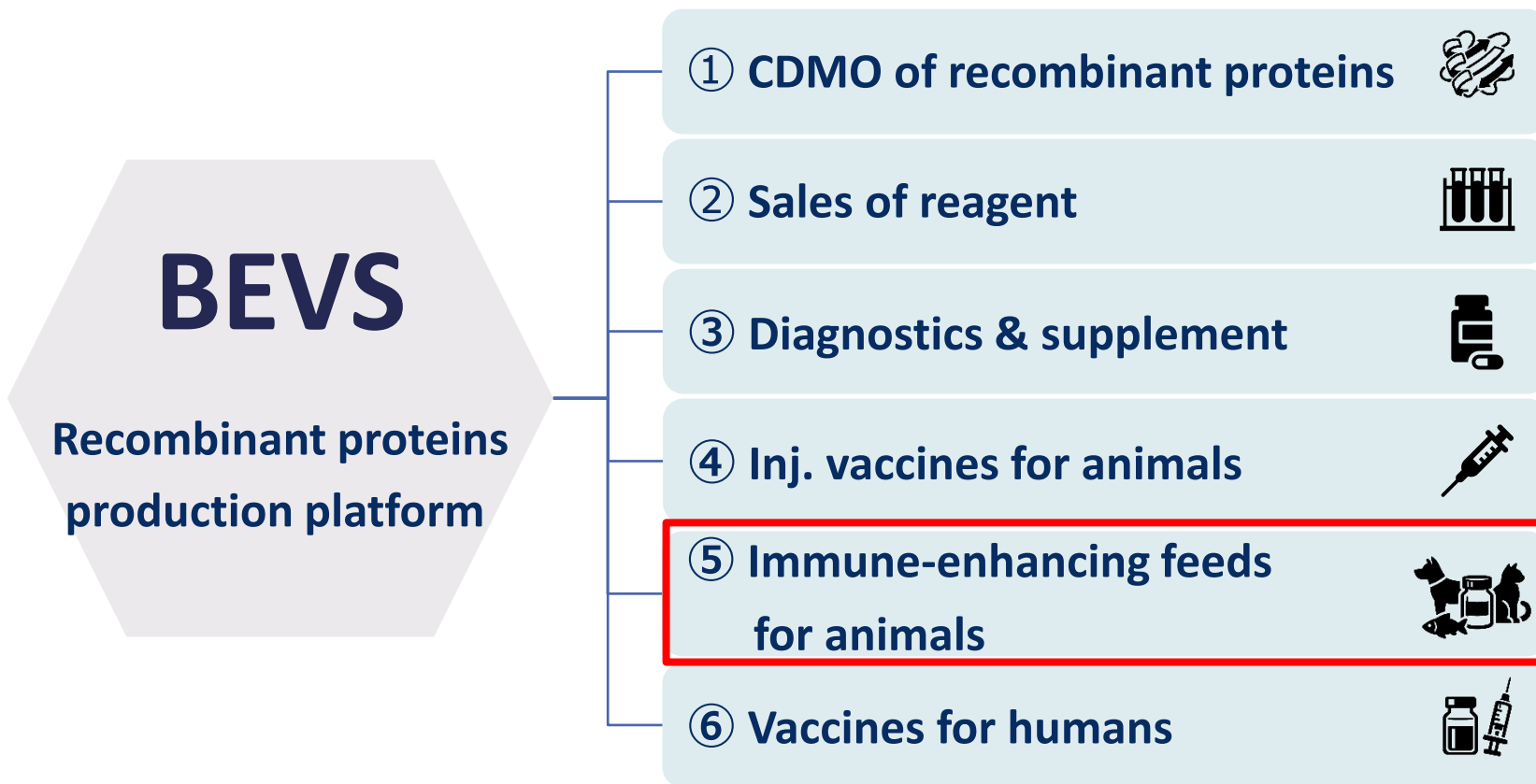
Baculovirus Expression Vector System

Silkworms are suitable for producing proteins that are difficult to express in cells or bacteria





We Make People & Animals Healthier by “BEVS”





Toward More Sustainable Swine Production

Conventional Vaccination Approach



- ▷ Repeated large-scale vaccination is labor-intensive
- ▷ Frequent injections increase stress on pigs & workers
- ▷ Needle-stick injuries & retained needles pose safety risks

Current vaccination practices face sustainability challenges

Feed-Based Preventive Approach



- ▷ Feed-based administration enables easy large-scale delivery
- ▷ Oral intake reduces stress on pigs & workers
- ▷ Needle-free approach minimizes safety & handling risks

Feed-based prevention supports a more sustainable approach



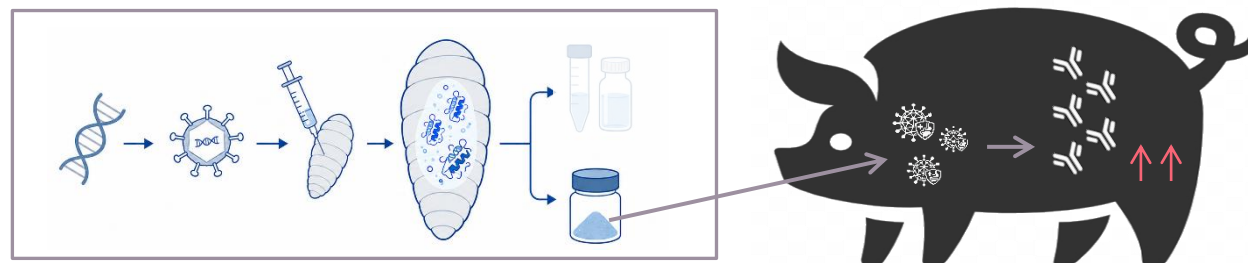
KAICO POWDER : An Innovative Solution



- ✓ Immune-support feed additive for pigs
→ Target Protein : Capsid protein of PCV2
- ✓ Mixable with standard feed and stable at room temperature
- ✓ Improved animal welfare through non-invasive delivery
- ✓ Maintains immune efficacy comparable to conventional vaccination



*PCV2 is a highly prevalent infectious disease in swine. It causes growth delays.





Results from Field Trials in Vietnam



| | Head count | Gained weight | Average Daily Gain | Mortality rate | Feed Conversion Ratio |
|--------------|------------|---------------|--------------------|----------------|-----------------------|
| KAICO Powder | 2,200 | ✓ | ✓ | ✓ | ✓ |
| PCV2 Vaccine | 1,108 | | | | |

| | Number of pigs | Number of staff | Time spent |
|--------------|----------------|-----------------|---------------|
| KAICO Powder | 1,189 | 1 | 5 mins |
| PCV2 Vaccine | 1,200 | 7 | 1 hour |

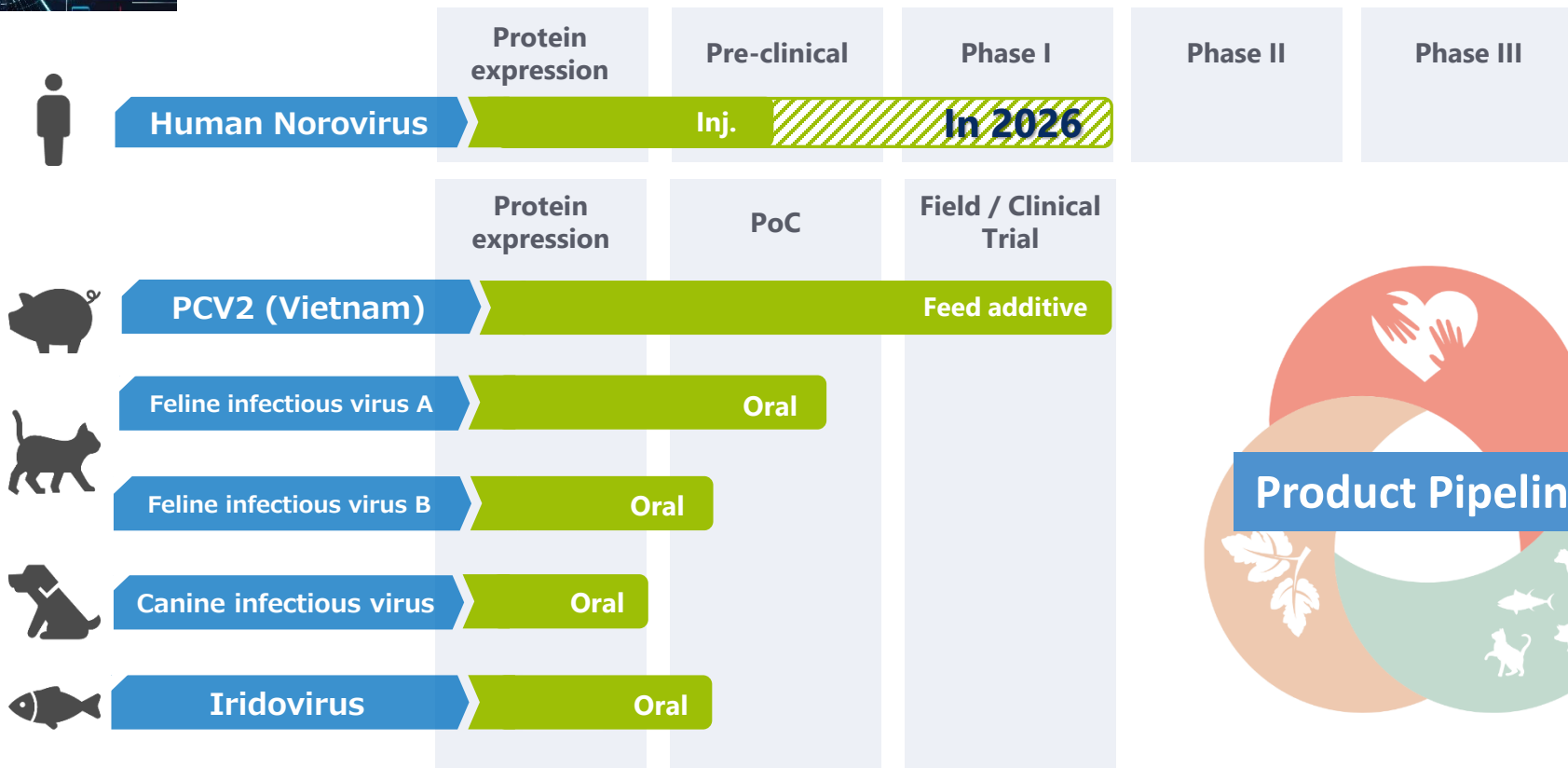
“The use of KAICO Powder may reduce animal stress by decreasing the need for injections, which could potentially contribute to improved survival rates.”

- Advisor of KAICO

- The KAICO Powder group showed **better performance** compared to the Vaccine group.
- Applying KAICO Powder can **eliminate up to 99% of labor hours**.
- The use of KAICO powder is expected to **enhance labor and economic efficiency on farms, while also reducing stress and the risk of needle-related accidents.**



Silkworms Connect between JAPAN & SPAIN



Advancing sustainable biotechnology together for animal and human health



Silkworms Connect between JAPAN & SPAIN

***Cordyceps sinensis* (冬蟲夏草 in Chinese), is known as a high-end herbal medicine.**

- ✓ It is a type of parasitic fungus that primarily infects insects in the Himalayan region.
- ✓ *Cordyceps sinensis* has been highly valued for its potential health benefits as a traditional medicine.
- ✓ *Cordyceps* supplements are available in various forms, including capsules and powders.
- ✓ While *Sinensis* is naturally derived, *militaris* can be artificially grown. Efficacies are the same.

At KAICO, we grow our original *Cordyceps militaris* in the lab's clean environment





Thank you for your attention

Discover More.



Change the World with Silkworms

KAICO

<https://www.kaicoltd.jp/>

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fukutomi@kaicoltd.jp