SPI Pharma™

An ABF Ingredients Company

VAC Saponin

Veterinary Vaccine Adjuvant

Q-VANT BIOSCIENCES™

VAC Saponin is an immunomodulatory adjuvant for veterinary use composed of the complete saponin profile from *Quillaja saponaria*. VAC Saponin is made from renewable plant biomass employing an industrial manufacturing process that guarantees batch-to-batch consistency in saponin composition.

VAC Saponin delivers performance comparable to or exceeding to Quil-A®, a safe and effective adjuvant (Quillaja saponin) carrying 3 decades of study and use in commercial veterinary vaccines with proven effectiveness and safety. VAC Saponin provides a higher purity and saponin content (90% vs. 70% Quil-A®), incorporating an analogous profile of immuno-active fractions QS-21 and QS-7, among others.

Broad immunological efficacy of saponin adjuvants

VAC Saponin complete saponin profile including key immunoactive components significantly enhances antibody production, Th1 T helper response and CTL production [1] which is a widely recognized and desired protective immune response for current veterinary vaccine development against pathogens of major veterinary interest [2-6]. The saponin technology builds on the established efficacy of over 97 commercial adjuvanted vaccines.

Figure 1. More common saponin adjuvanted vaccines and diseases.

Adjuvant Safety

The safety of VAC Saponin was demonstrated in two pig and 1 mice studies, evaluating clinical signs, body temperature, animal weight, local reactions at the injection site, histopathological assessment of injection site and vital organs, biochemical profile and hepatic function. VAC Saponin is currently incorporated into developing vaccines.

VAC Saponin poses no environmental risk (VICHGL6-EIAS) and is exempt from MRL in all food producing species (EEC 2377/90).

Adjuvant Efficacy

VAC Saponin vs Quil-A® immunization comparison against classical swine fever virus.

3 groups of 5 pigs each were immunized with E2 glycoprotein plus VAC Saponin (200 µg, 400 µg), 200 µg of Quil-A®. At day 35, the group vaccinated with VAC Saponin achieved comparable IgG levels to Quil-A®. Doubling the VAC Saponin dose resulted in a 60% increase in antibody production. VAC Saponin stands as a valid sustainable alternative for conventional Quillaja saponin adjuvants existing in the market.

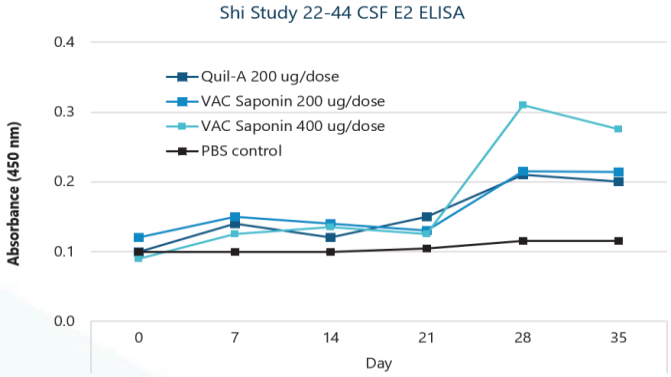

Figure 2. Levels of anti-glycoprotein E2 antibody measured by indirect ELISA (Kansas State University).

Q-VANT manufacturing standard.

VAC Saponin is manufactured employing rigorous standards for high purity and is designed to be used in animal immunization applications due to its potent adjuvant activity. VAC Saponin purity level is equivalent or greater than other commercial adjuvants integrated in multiple animal vaccines.

Q-VANT utilizes lyophilization technology rendering the utmost solubility, and molecule stability by avoiding shear stress and preventing thermal hydrolysis of saponin particles.

VAC Saponin is manufactured in compliance with GMP (EXCiPACT).

Supply continuity

VAC Saponin adjuvant is obtained from fully sustainable sources of Quillaja and manufactured under scalable extraction and purification processes. Q-VANT utilizes Quillaja biomass sources including its own plantations, green houses, and plant cell technology. VAC Saponin highly purified saponin adjuvant is commercially and readily available.

Dosage

The rate for VAC Saponin is low marking the cost per dose competitive with other adjuvant technologies.

Species	Dose (µg)
Guinea Pigs	25
Rabbits	50
Poultry	50
Sheep	300
Pigs	300
Cattle	350

References

1. von Halling Laier, C., et al., Spray dried cubosomes with ovalbumin and Quil-A as a nanoparticulate dry powder vaccine formulation. Int J Pharm, 2018. 550(1-2): p. 35-44.
2. Cokcaliskan, C., et al., Evaluation of Quil-A, E. coli DNA and Montanide ISA 206 adjuvant combination on the antibody response to foot-and-mouth disease vaccine in sheep. Acta Virol, 2022. 66(3): p. 197-205.
3. Rathogwa, N.M., et al., Efficacy of SAT2 Foot-and-Mouth Disease Vaccines Formulated with Montanide ISA 206B and Quil-A Saponin Adjuvants. Vaccines (Basel), 2021. 9(9).
4. Charemtantanakul, W. and S. Pongjaroenkit, Co-administration of saponin quil A and PRRSV-1 modified-live virus vaccine up-regulates gene expression of type I interferon-regulated gene, type I and II interferon, and inflammatory cytokines and reduces viremia in response to PRRSV-2 challenge. Vet Immunol Immunopathol, 2018. 205: p. 24-34.
5. Villa-Mancera, A., et al., Cathepsin L1 mimotopes with adjuvant Quil A induces a Th1/Th2 immune response and confers significant protection against Fasciola hepatica infection in goats. Parasitol Res, 2014. 113(1): p. 243-50.
6. da Cunha, I.A., et al., Humoral and cellular immune responses in pigs immunized intranasally with crude rhoptry proteins of Toxoplasma gondii plus Quil-A. Vet Parasitol, 2012. 186(3-4): p. 216-21.