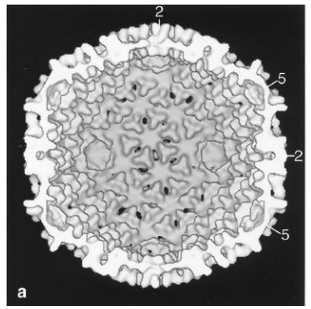
Concept



Infectious Bursal Disease Virus (IBDV) capsids are highly immunogenic

Viral-like particles (VLP) based on the IBDV capsid may be engineered to allow the insertion of short amino acid sequences that will be expressed without affecting self-assembling.

Those VLPs may be produced in expression systems (yeasts, etc.)

Concept

- ✓ For most **pestiviruses**, **protection** is mediated by neutralizing antibodies directed to the **E2 protein**
- ✓ The E2 neutralizing epitopes of BVDV are known
- ✓ Two BVDV genotypes are recognized (BVDV-1 and BVDV-2) several subgenotypes are included in each genotype
- ✓ The neutralizing epitopes in E2 are partially conserved although genetic divesity may affect cross-neutralization

By means of a bioinformatic analysis of available E2 sequences (Genbank), a set of potentially cross-reactive peptides with expected capability for inducing neutralizing antibodies were synthesized

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Concept

- ✓ Peptides were tested against sera of BVDV-positive and negative animals in a peptide ELISA
- ✓ They were tested as well in a competition ELISA to assess wether depletion of peptide-specific antibodies reduced reactivity with BVDV virus

Finally, two peptides P99 and P35 were identified as the most reactive with sera of BVDV-positive animals

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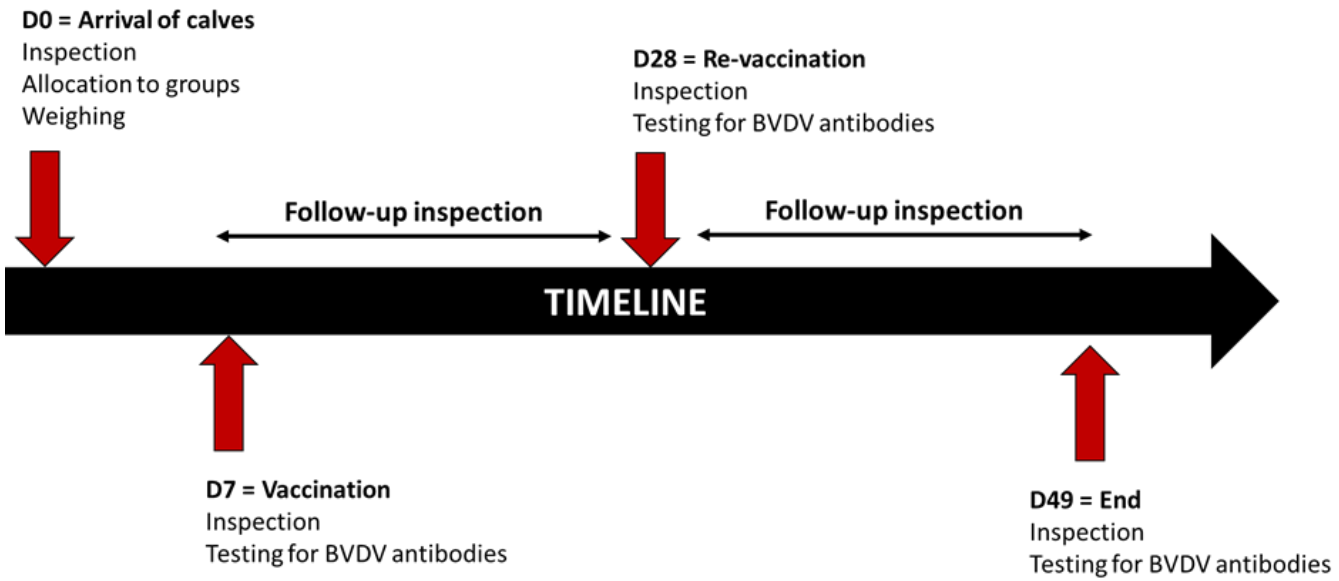
Background

In a preliminary experiment, the immunogenicity and safety of the VLP-peptide constructions was tested in BVDV-free calves



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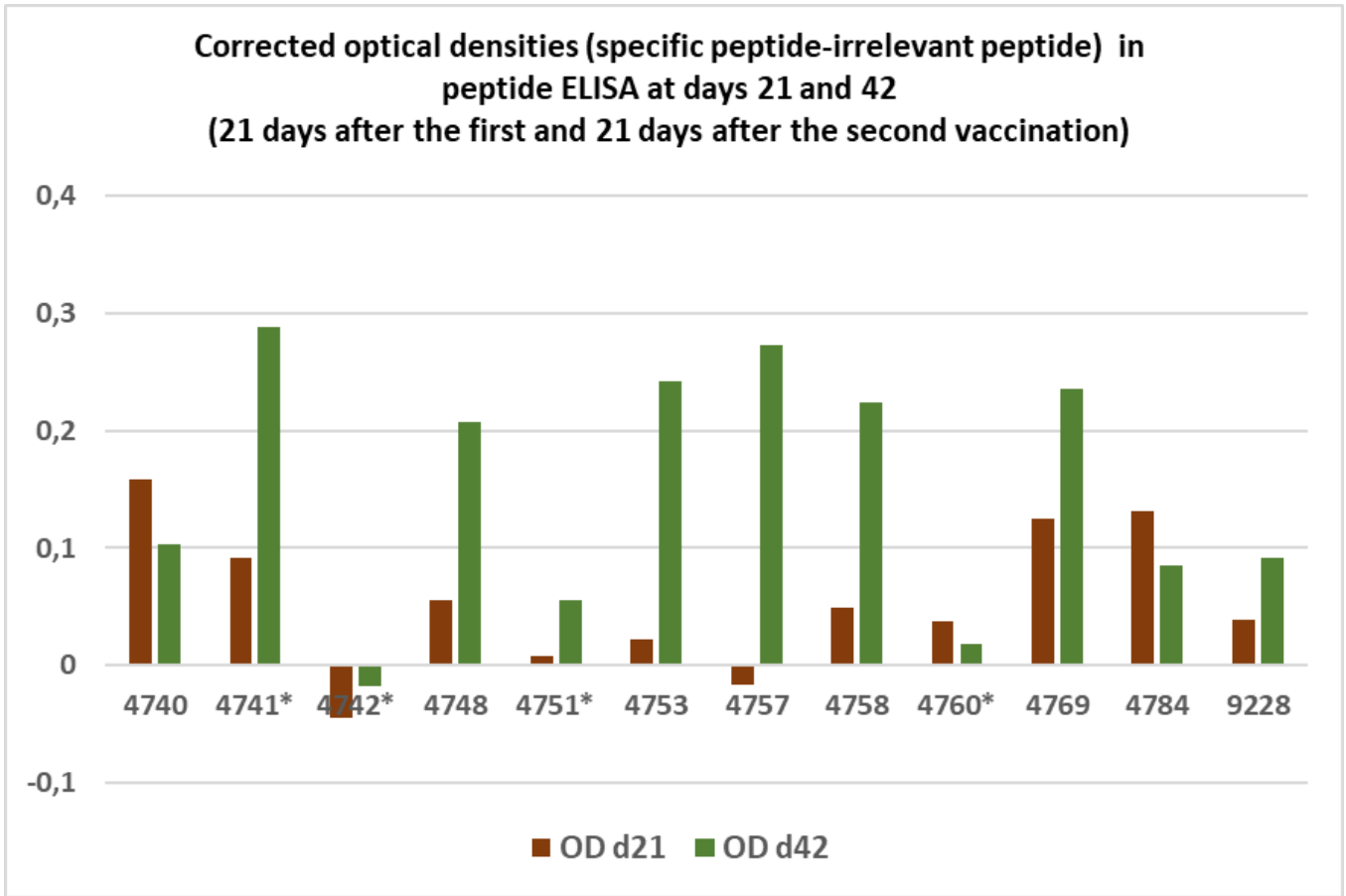
Background

The VLP-construct produced a **seroconversion against the BVDV-peptides** and **was safe** although the strength of such response was limited



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Background

A **new VLP-production process** was developed to increase the concentration of the VLP.

The product is now re-tested on calves

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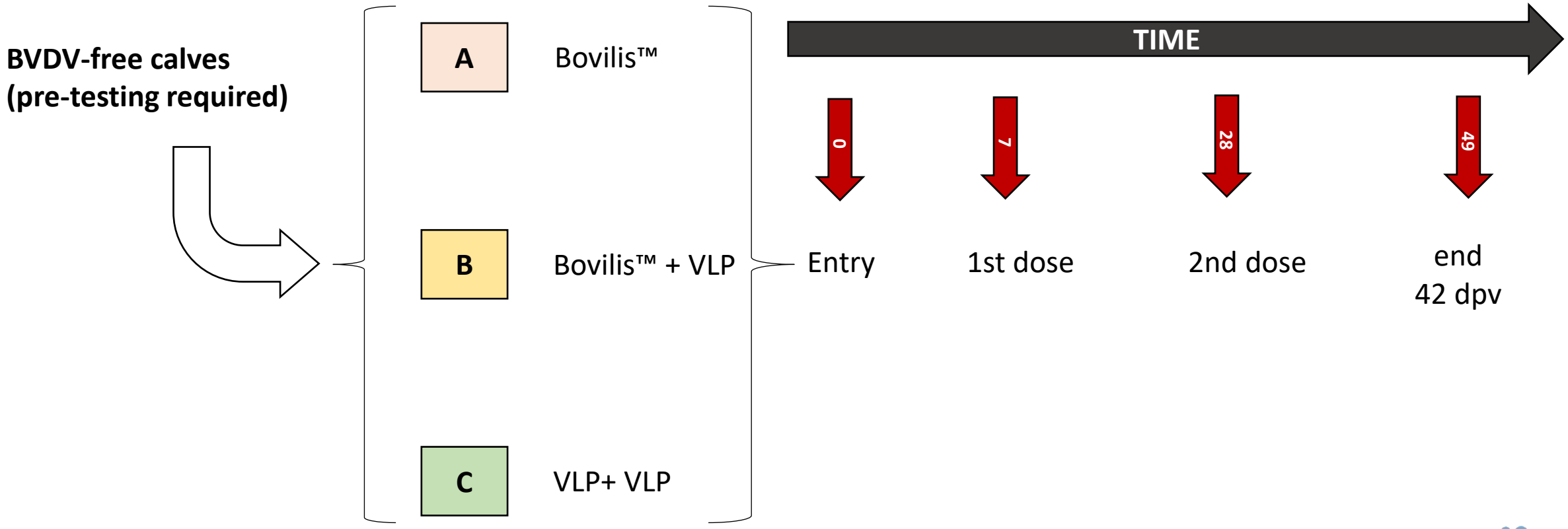
Experimental design



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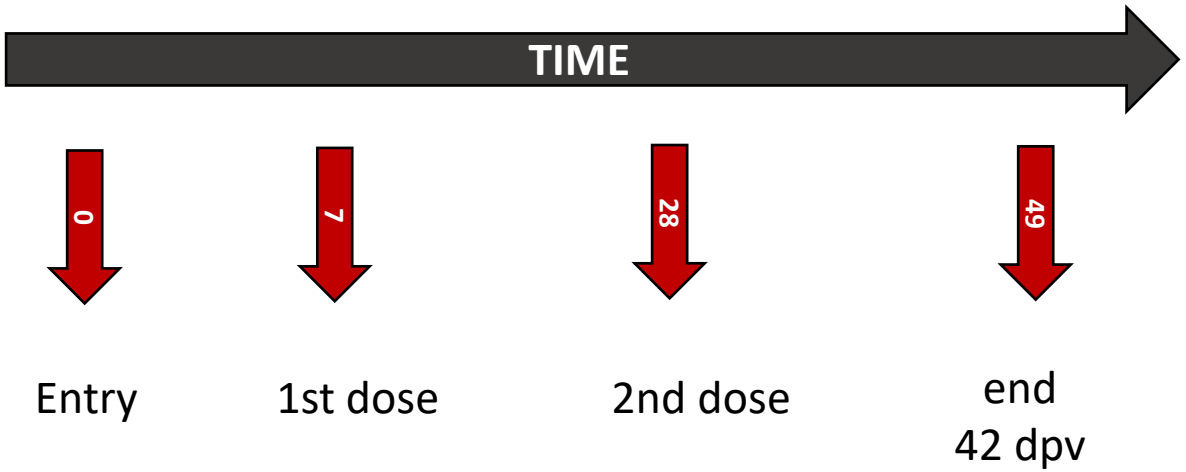

Bleeding

- **Total BVD antibodies**
- **Anti-p80 antibodies**
- **P99 and P35v antibodies**
- **Anti-IBDV VP2 antibodies**
- **Neutralizing antibodies**

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Development of the experiment

Frisian x Aberdeen Angus crossbred calves were purchased for the study

Animals were pre-tested for p80 BVDV-antibodies and BVDV-antigen (capture ELISA)

At the beginning of the study, the average weight was 380±38 Kg

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REFERENCIA MUESTRA		BVD Ag	BVD p80
1	0682	-	-
2	0636	-	-
3	0634	-	-
4	0674	-	-
5	0677	-	-
6	0675	-	-
7	0689	-	-
8	0634	-	-
9	0628	-	-
10	0686	-	-
11	0639	-	-
12	0664	-	-
13	0645	-	-
14	0623	-	-
15	0629	-	-
16	0659	-	-
17	0697	-	-
18	0665	-	-

All animals were negative for **p80 antibodies** and for **BVDV antigen** as expected because of the BVDV-free status of the source farm

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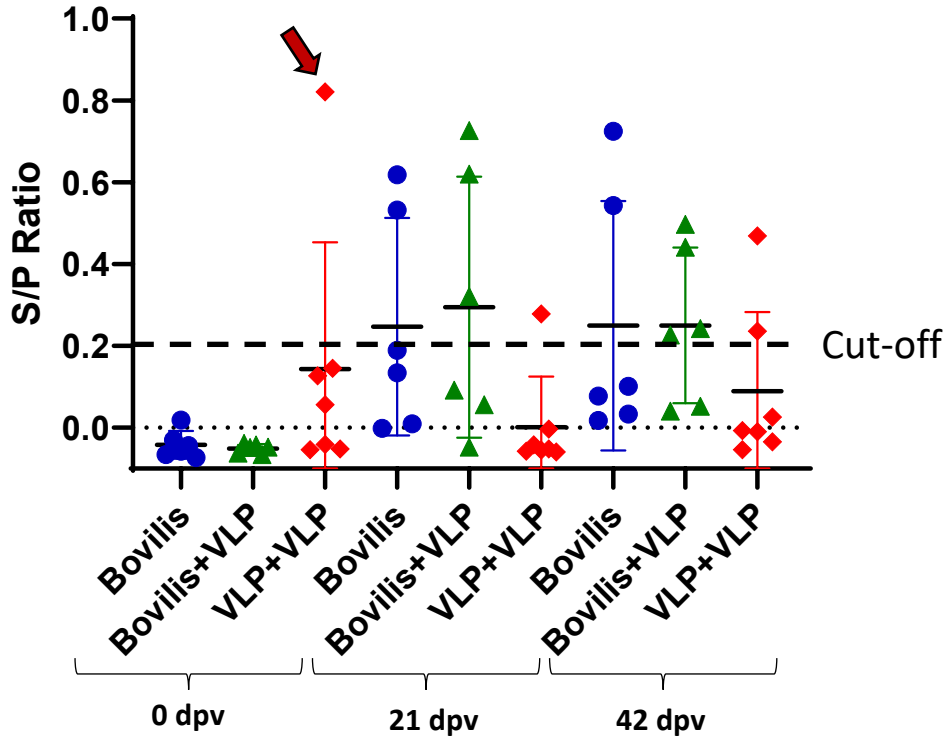
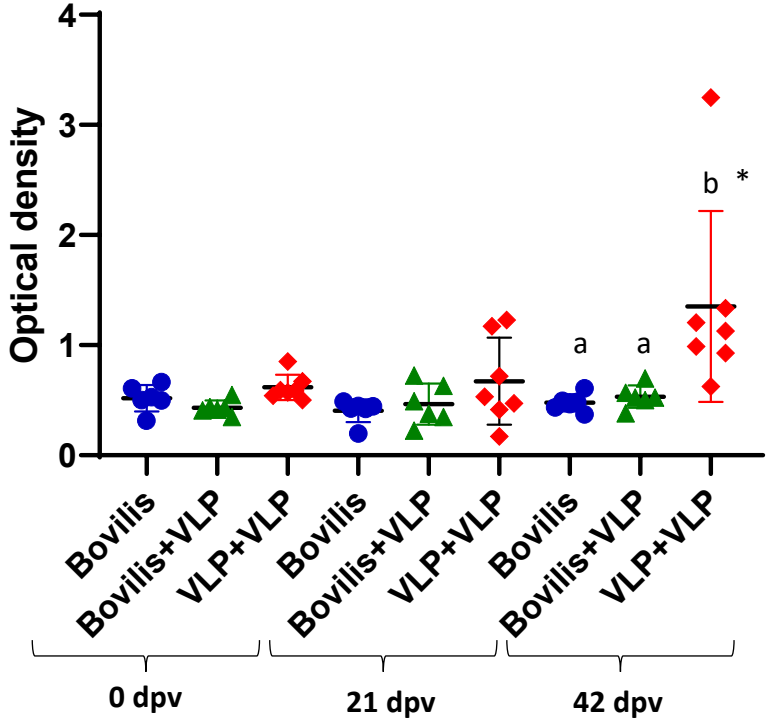
Total BVDV antibodies



This animal tested negative 5 days before.

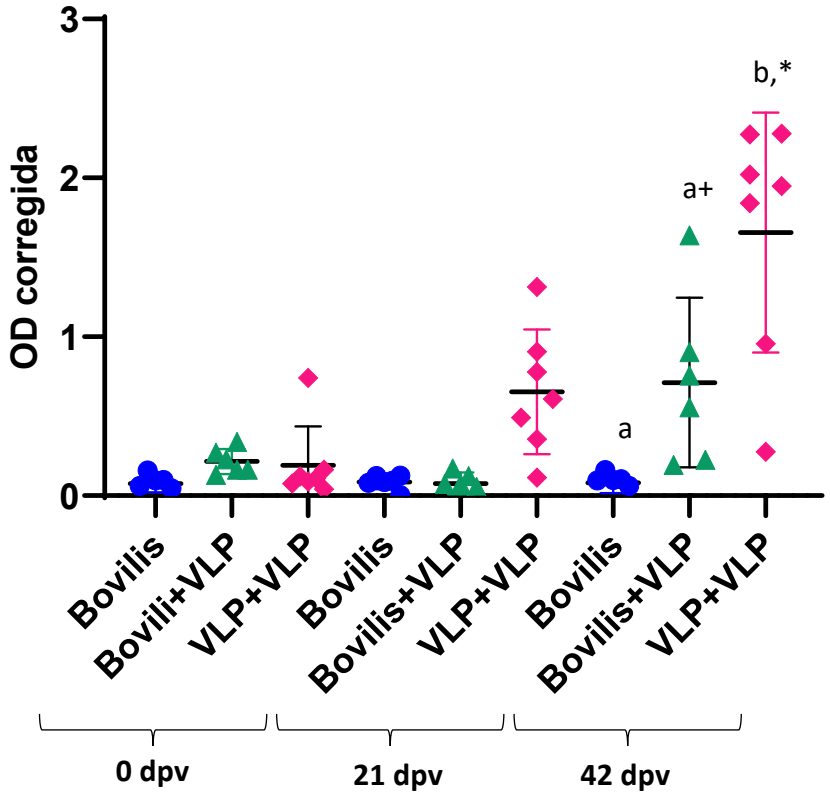
Non-significant differences between groups

VP2 antibodies

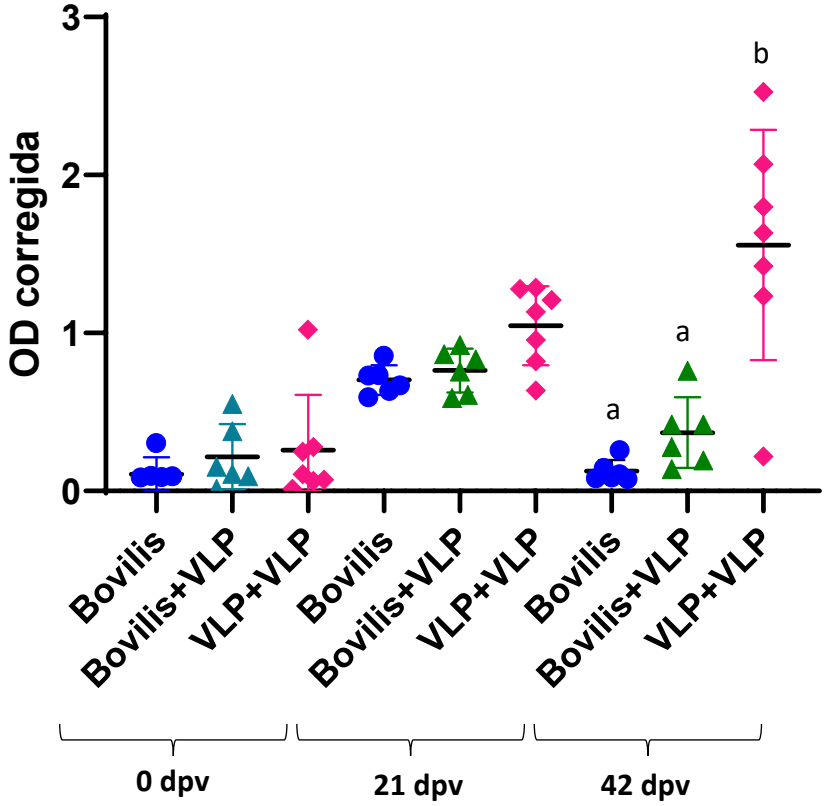


VP2 OD increased significantly in the VLP+VLP group at 42dpv

Péptido 99



Péptido 35



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Conclusions

Peptide 99 (BVDV-1b) was only recognized by VLP-vaccinated animals, indicating the specificty of this antigen

Peptide 35 (BVDV-1a) was recognized by animals vaccinated with VLP and with Bovilis+VLP (as expected since Bovilis is BVDV1a)

The insertion of BVDV epitopes was eficient to induce specific antibodies

Analysis of neutralizing antibodies is ongoing

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