Development of Immunity Using a MLV-BVDV Vaccine Against a Virulent Type II BVDV Causing High Mortality

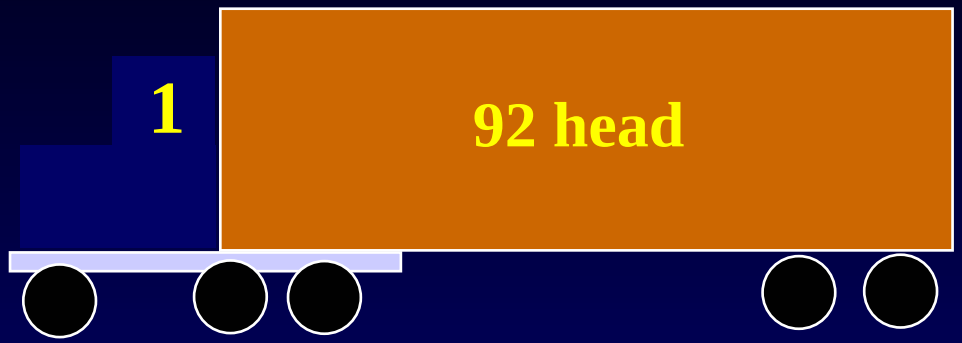
[1]K. Brock, [1]P. Walz, [2]P. Widel

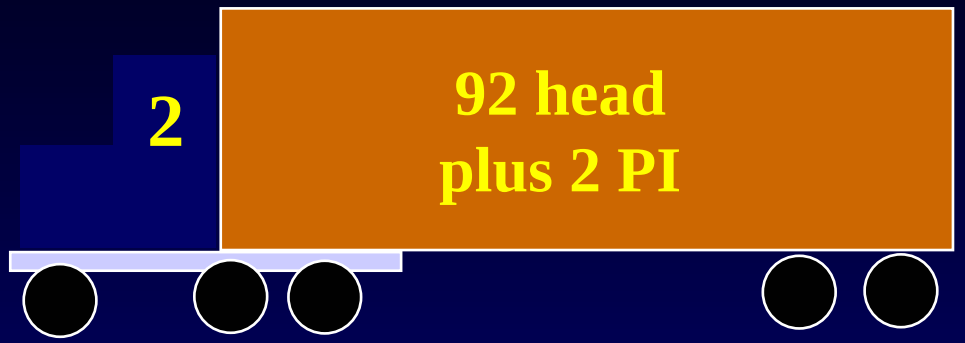
[1]Auburn University, College of Veterinary Medicine

[2]Boehringer Ingelheim Vetmedica, Inc. St. Joseph, MO, USA

BVDV Control

Study Design





Shipment

Vaccinated with MLV BVDV on arrival

Barn 1

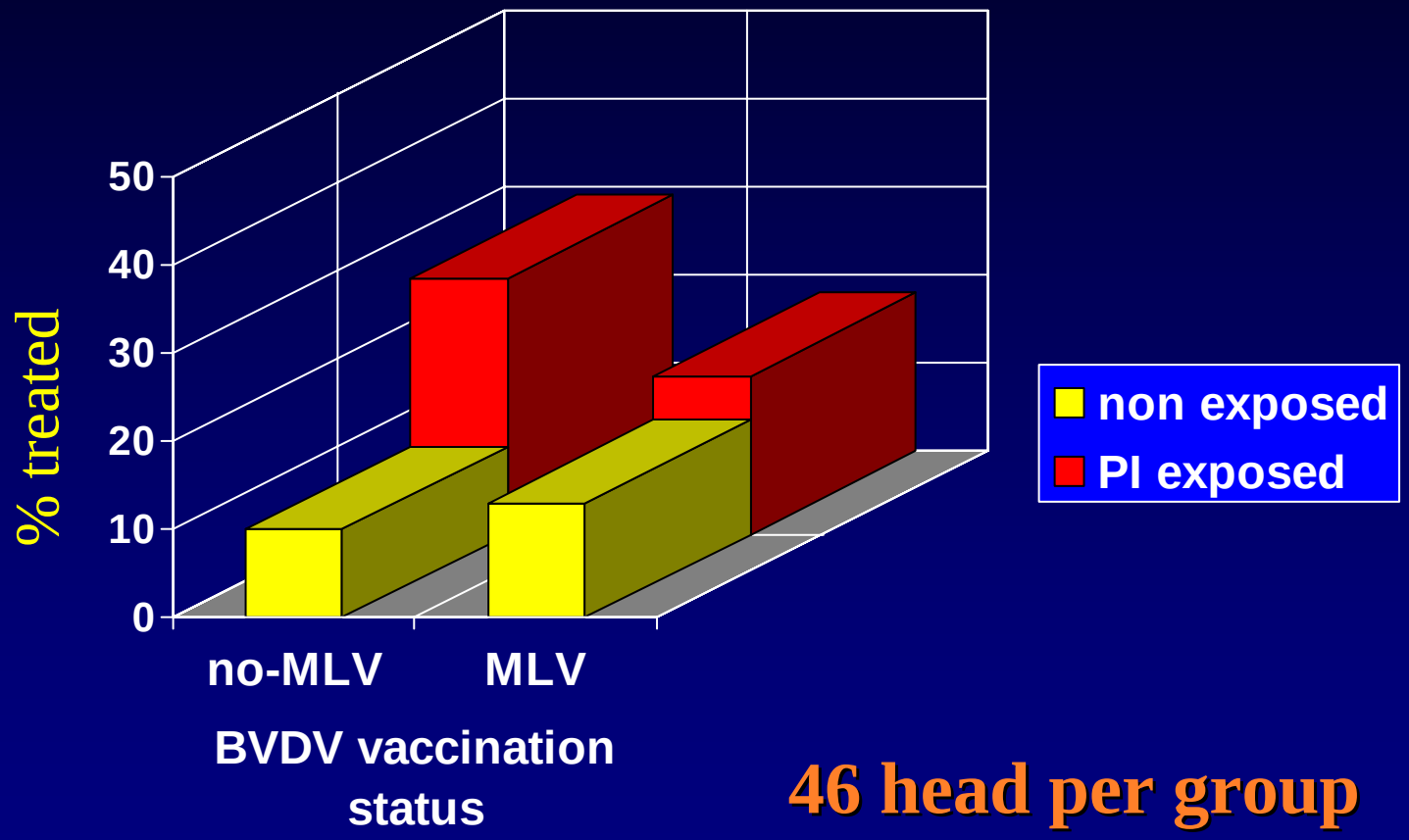
46 head vaccinated
46 head non-vaccinated

Barn 2

46 head vaccinated
46 head non-vaccinated

2 PI animals

Percentage of animals treated during feeding period



46 head per group

BVDV Control

Challenge strain: 1373

- NCP
- Type II
- Highly virulent
- Characterized Genomic nucleotide sequence

BVDV Vaccine:

- Type Ia - II MLV vaccine (cp BVDV)
- Commercially available

Inserted sequence

described by Ridpath et al.

```
28508-5          RIFIREG--- ---------- ---NFDGLFR
1373             KKFIREESSC PVPFDPSCHC NYFRHDGPFR
793              KIFIREESSC PVPFDPSCHC NYFRHDGPFR
SDSU 37621A      KIFIREESSC PMPFDPSCHC NYFRHDGPFR
```

BVDV Control

- Study Design
  - 40 BVDV seronegative, BVDV-free, weaned, calves
  - Vaccinate 3 groups of 10 calves at:
    - -7 days from challenge
    - -5 days from challenge
    - -3 days from challenge
  - Challenge by intranasal route on Day 0
  - Monitor clinical signs, clinical pathology, and viremia for 14 days.

BVDV Control

1373 BVDV challenge induced severe, primary respiratory tract disease

BVDV Control

- Weight loss
- Anorexia
- Mild diarrhea
- Serous nasal

BVDV Control

Acute Death Loss

BVDV Control

Primary viral pneumonia with no evidence of secondary bacterial infection.

BVDV

No evidence of hemorrhagic disease as previously reported with type II BVDV.

Mucosal-like lesions in some cases.
No evidence of hemorrhagic lesions as reported with type II BVDV.

BVDV Control

Acute Death Loss

- Highly virulent BVDV (2)
- 6/10 non-vaccinated controls died within 14 days.
- 2/10 calves VTx. at -3 days to challenge died.
- 0/10 calves VTx at -5 days died.
- 0/10 calves VTx at -7 days died.

BVDV Control

Viremia

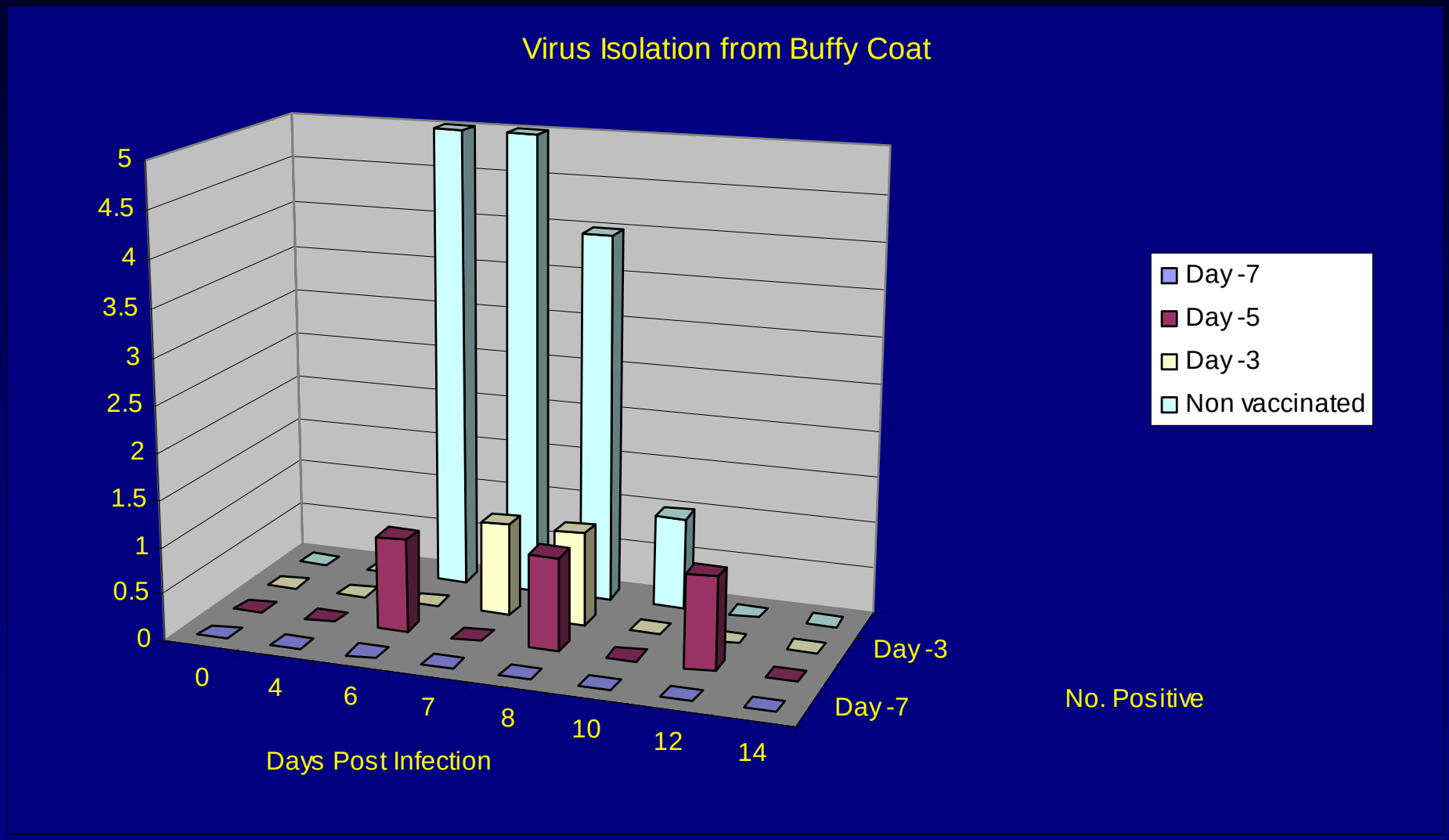
Nasal Swabs

10/10 controls positive (Day 6 to 10)
Day -3 Vaccinates: 3/10 positive (Day 6 to 8)

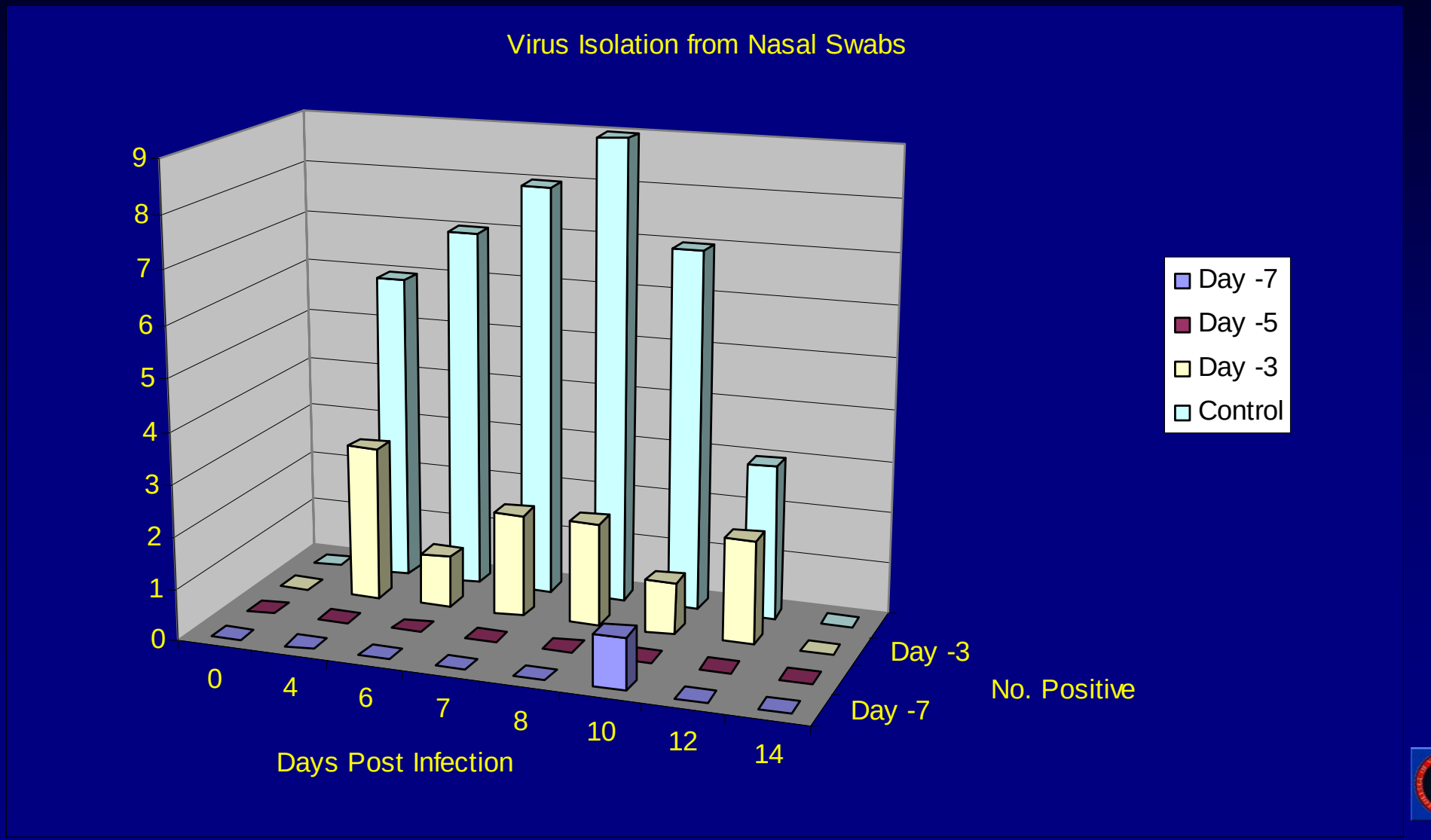
Buffy coat virus isolation

7/10 controls: positive (Day 6 to 10)
Day -3 Vaccinates: 2/10 positive (Day 6&8)
Day -5 Vaccinates: 1/10 positive (Day 7-8)

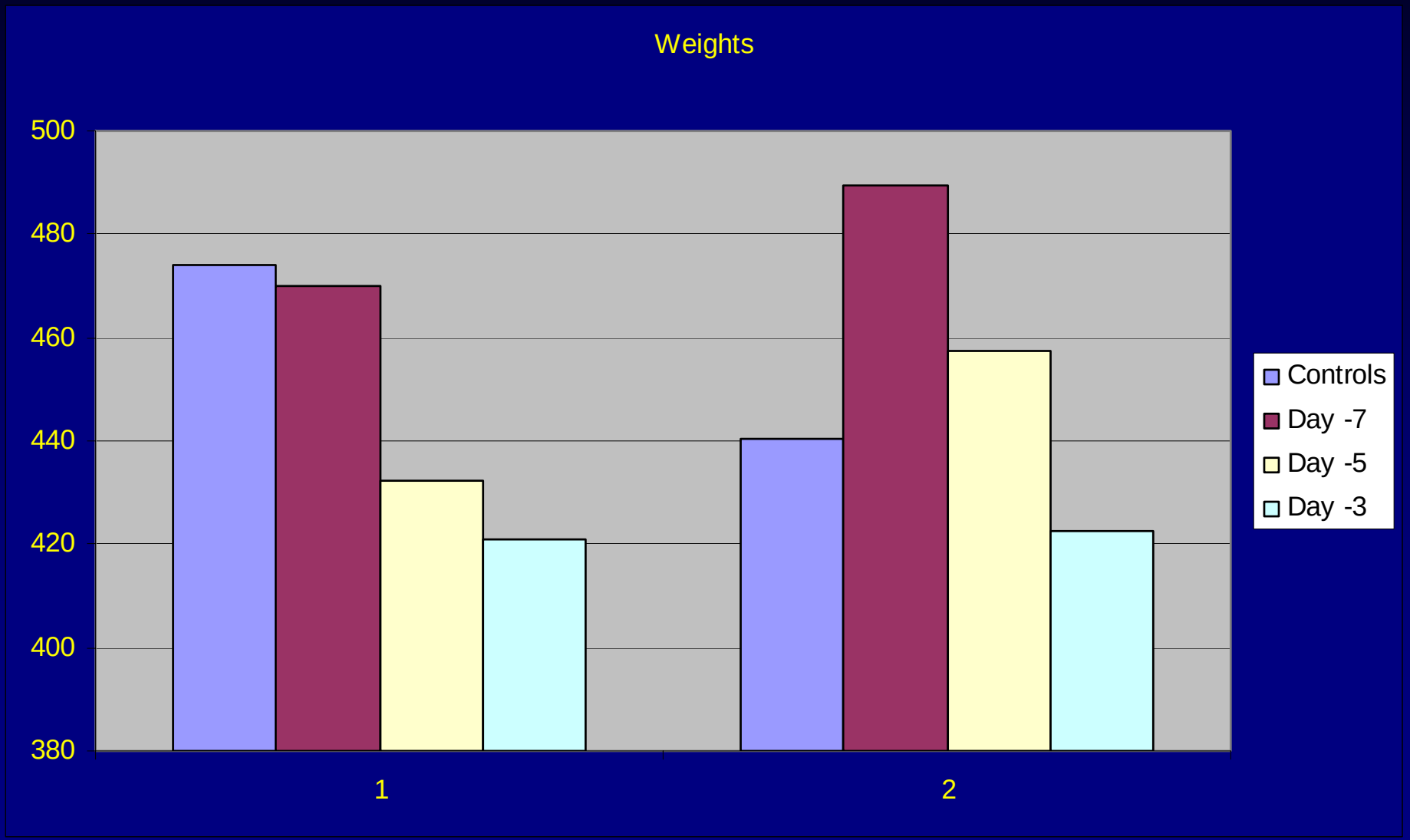
BVDV Control



BVDV Control



BVDV Control



BVDV Control

Conclusions:

- 1373 BVDV challenge provides good model to determine ability of BVDV vaccines to prevent acute disease.

- MLV BVDV can induce rapid immunity in face of BVDV challenge.

BVDV Control

BVDV

www.stopbvd.com