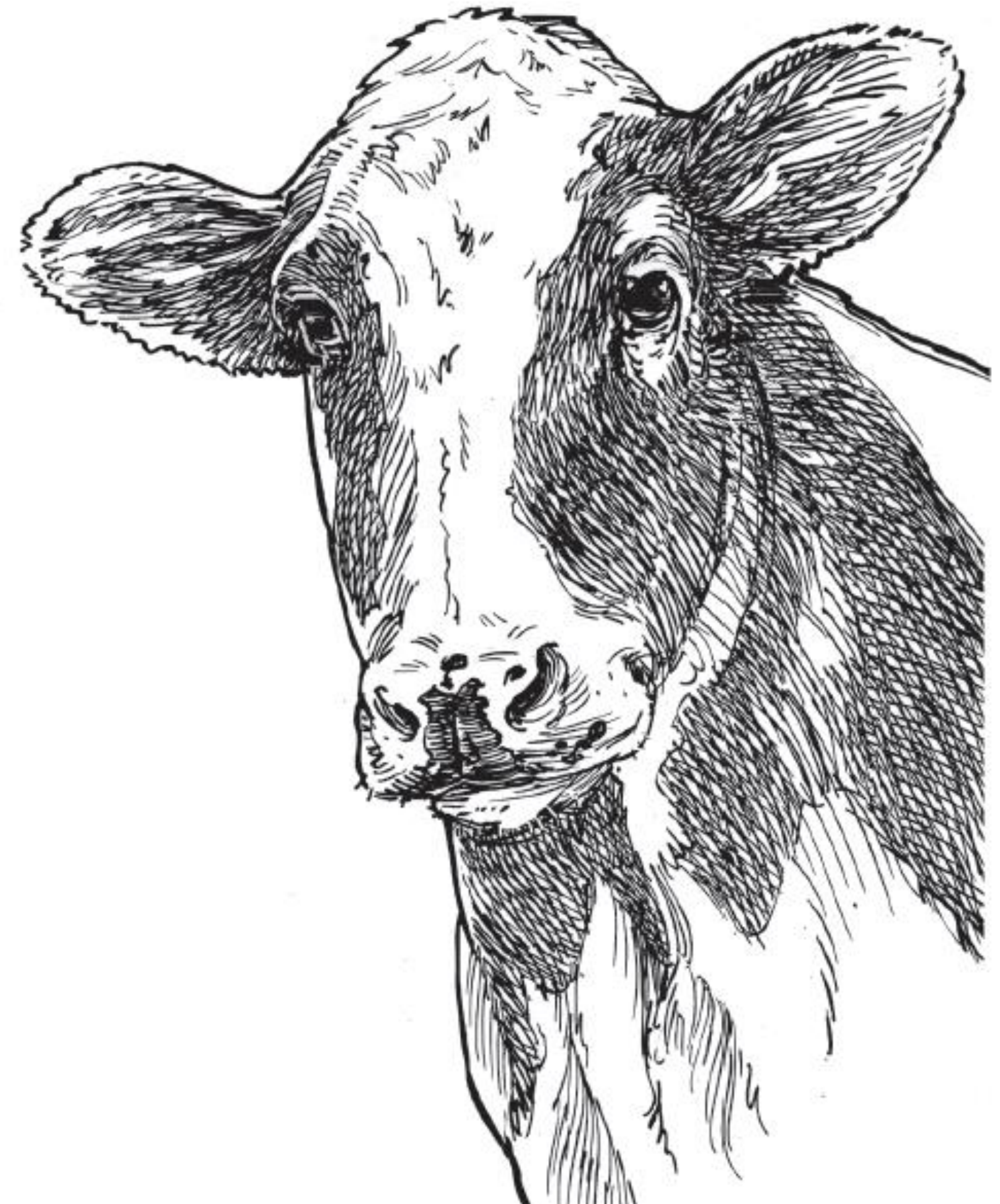


The IDEXX Milk Pregnancy Test

Christoph Egli, DVM



Discussion Topics

- What is the IDEXX Milk Pregnancy Test?
- How does the IDEXX Milk Pregnancy Test work?
- What is the performance of the IDEXX Milk Pregnancy Test?
- When can the IDEXX Milk Pregnancy Test be used?
- How can vets and producers use the IDEXX Milk Pregnancy Test to maximize reproductive efficiency?

Why is Pregnancy Diagnosis Important?

- The primary motivation for pregnancy diagnosis is the management of calving interval in the herd
- Considerations include:
 - Relatively poor performance of artificial insemination (AI)
 - Lactation management
 - Culling decisions
 - Performance monitoring

Pregnancy Diagnosis in Dairy Cattle

Current Methods of Pregnancy Diagnosis

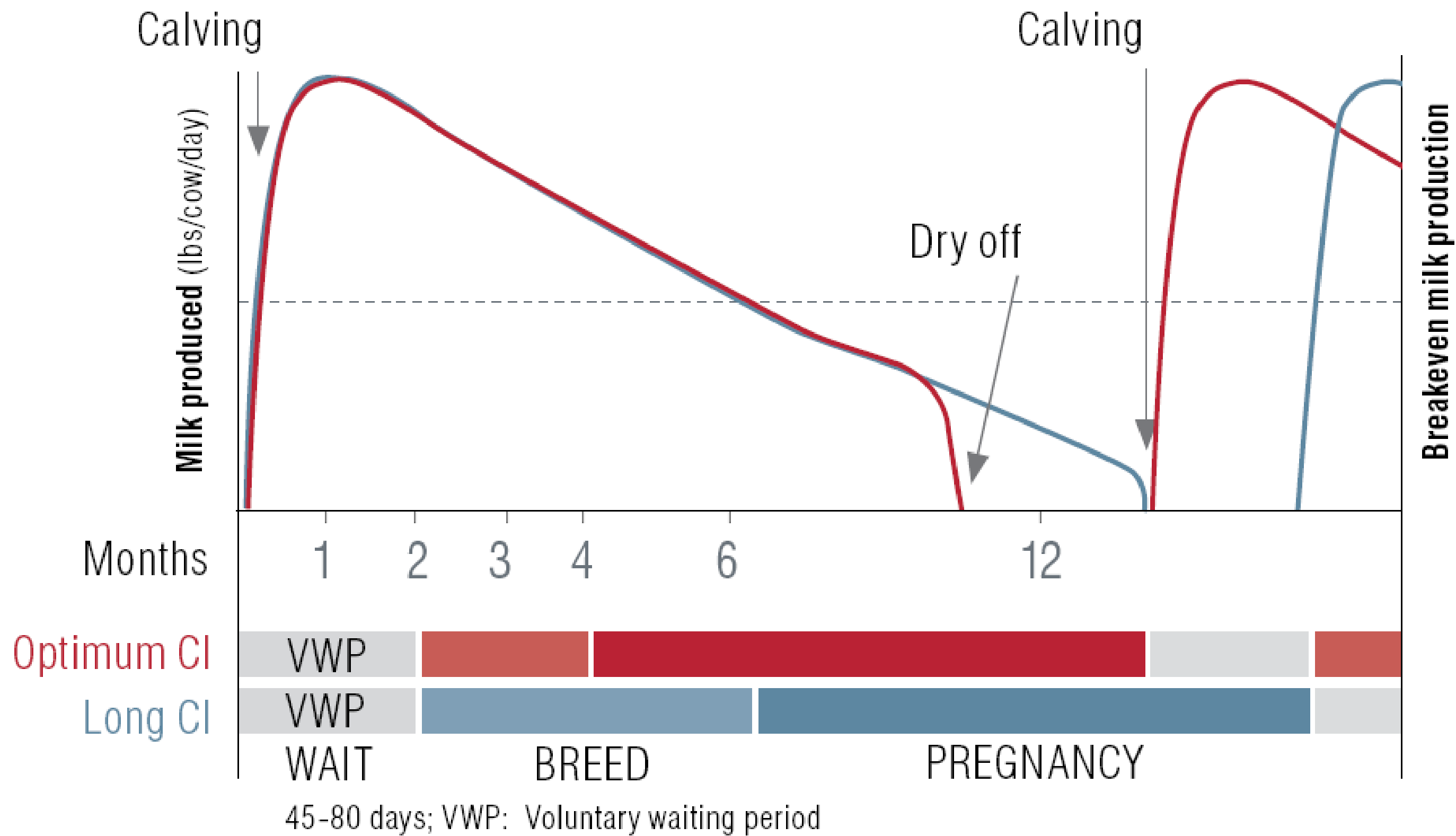
- Rectal palpation
- Ultrasound
- Progesterone
- Early Conception Factor
- Oestrone Sulphate
- Pregnancy Associated Glycoproteins (PAGs)



What are the Consequences of Poor Dairy Herd Fertility?

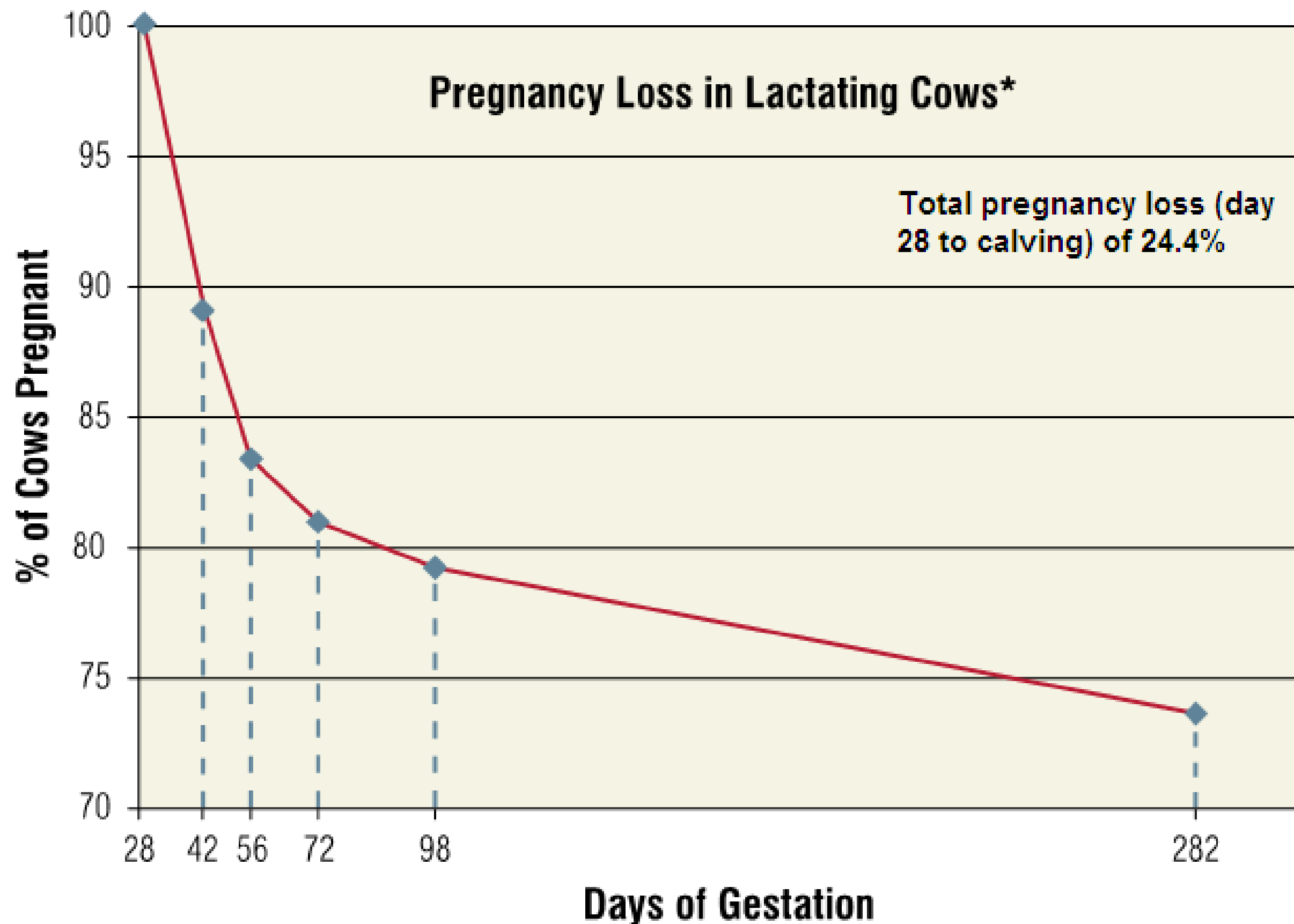
- Loss of milk production
- Disruption to the calving season and milk production pattern
- Enforced culling, resulting in more replacements being reared or bought and loss of mature cow production
- Reduced calf sales
- Loss of valuable genetics
- Additional AI costs
- Extra veterinary treatment costs

Managing Calving Intervals



Source: de Vries, et al. Economics of improved reproductive performance in dairy cattle.

Pregnancy Loss in Dairy Cattle



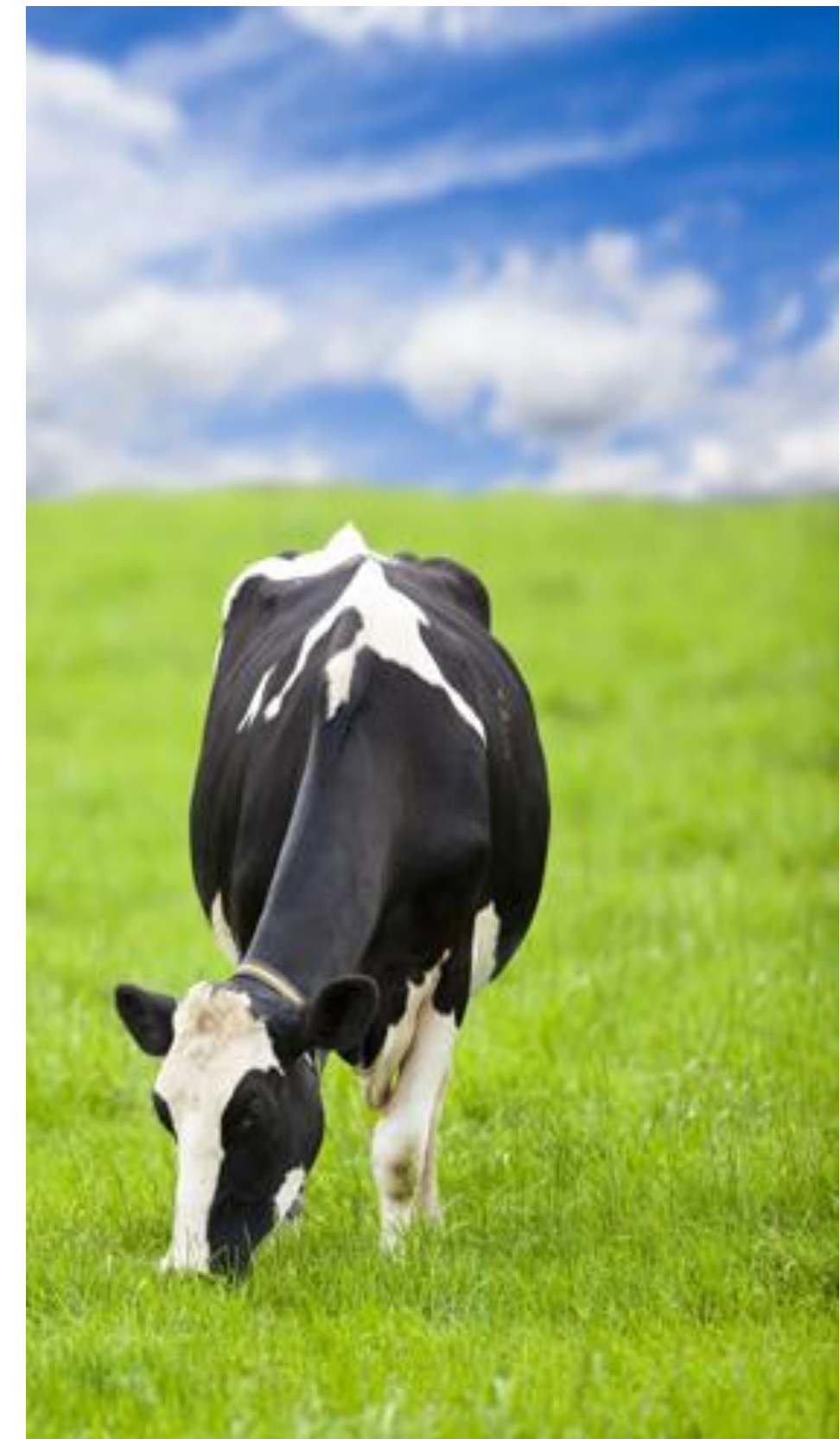
- Pregnancy diagnosis was conducted at 28, 42, 56, 70, and 98 days post AI for 1,600 dairy cows
- The conception rate of cows at 28 days post AI was 32%, and overall pregnancy loss from day 28 to calving was nearly 25%
- Pregnancy confirmation throughout gestation aids timely identification of open cows

*Chart adapted from Vasconcelos et al, 1997.

IDEXX Milk Pregnancy Test

A New Opportunity for Laboratory-Based Pregnancy Testing

- **Accurate determination of pregnancy status** - High levels of sensitivity and specificity from day 35 post breeding and throughout gestation
- **Trusted, timely results** - Obtain results in less than 3.5 hours using proven IDEXX ELISA technology
- **Expanded testing options** - Test for pregnancy from routine milk samples
- **Improved reproductive performance** - Earlier identification and rebreeding of open cows results in shorter calving intervals and increased milk production

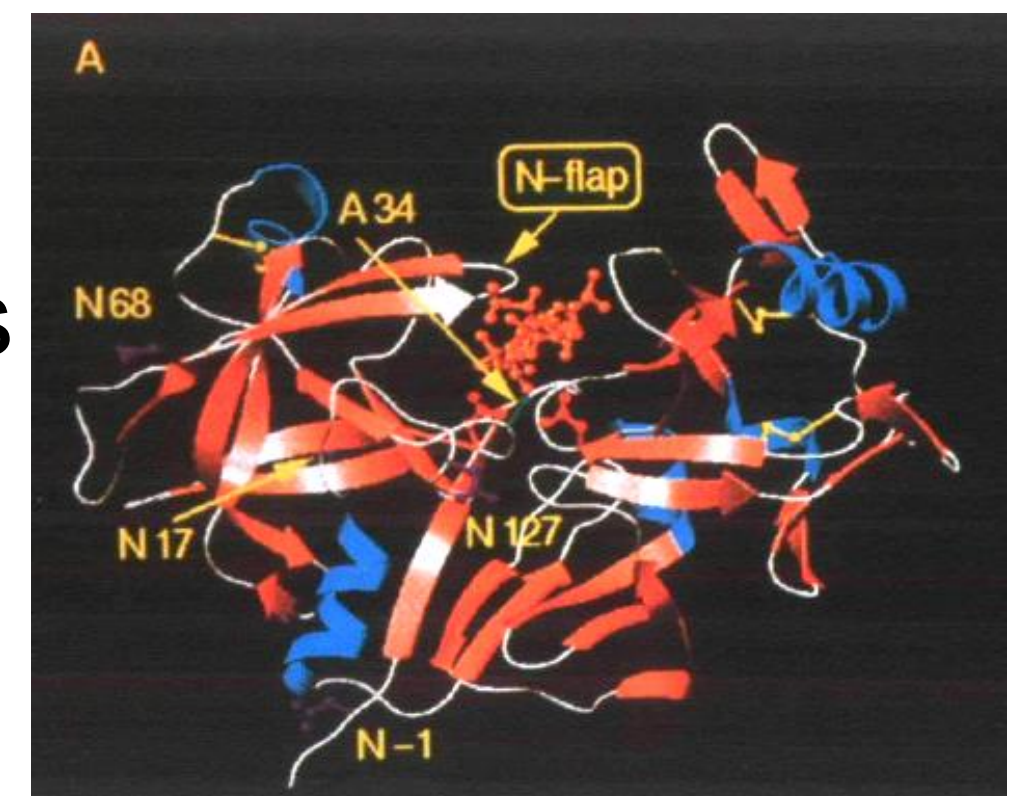


IDEXX Milk Pregnancy Test

Technology

Pregnancy Associated Glycoproteins (PAGs)

- Target antigen for the IDEXX Milk Pregnancy Test
- Placenta-specific expression
 - Expressed in maternal and embryonic regions of the placenta
- Subgroup of aspartic protease family
 - 22+ bovine transcribed genes identified
- Temporally expressed
 - Variable gene expression at different stages of pregnancy
- True function not well understood



Source: Guruprasad et al, 1996.

IDEXX Milk Pregnancy Test

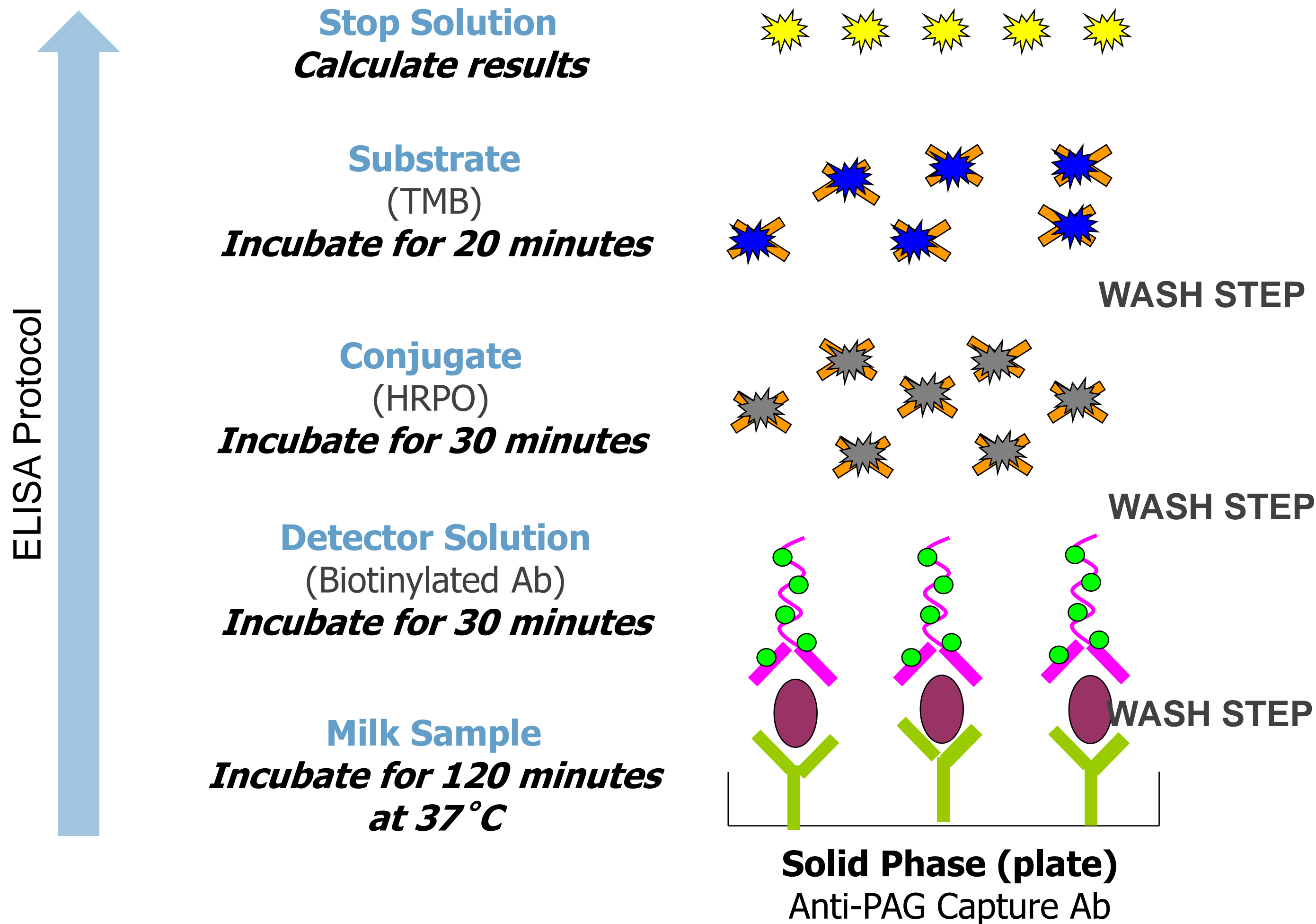
Trusted, simple ELISA platform

- **Principle of the assay**
 - Laboratory-plate ELISA for the detection of pregnancy associated glycoproteins (PAGs)
- **Sample type**
 - Bovine milk
 - Whole or skim
 - Fresh or preserved
- **Test protocol**
 - Ready-to-use reagents
 - Total assay time less than 3.5 hours
- **Kit configuration**
 - 5-plate kit
 - Strip format (1 x 8)



IDEXX Milk Pregnancy Test

Trusted, simple ELISA platform



IDEXX Milk Pregnancy Test

Result Interpretation

Validity	Mean positive control OD – Mean negative control OD ≥ 0.500 Mean negative control ≤ 0.200
Calculation	S – N
Result	S – N < 0.100 = Not pregnant (open) S – N ≥ 0.100 and < 0.250 = Recheck to confirm pregnancy status S – N ≥ 0.250 = Pregnant

Recheck:

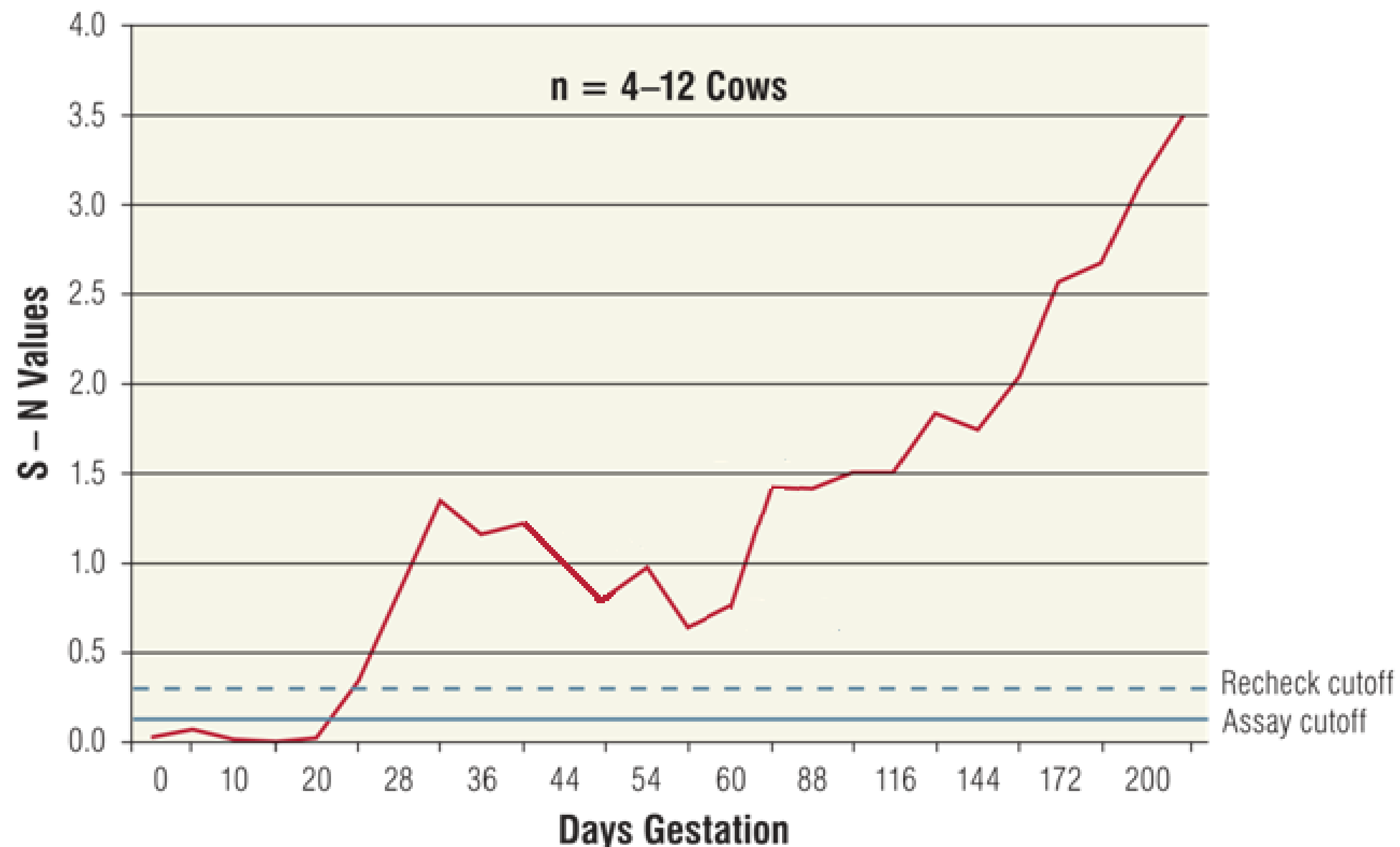
- Embryonic death is common in early stages of cow pregnancy and PAGs can circulate in cows/heifers for some time after early embryonic death

IDEXX encourages producers to work closely with their veterinarian to develop a reproductive management program that is appropriate for their operation

IDEXX Milk Pregnancy Test

PAG Levels in Milk

- Pregnancy Associated Glycoproteins (PAGs) are detectable early in pregnancy and throughout gestation
- Variability in PAG levels detected from different cows*
- Very strong signal in late gestation through calving



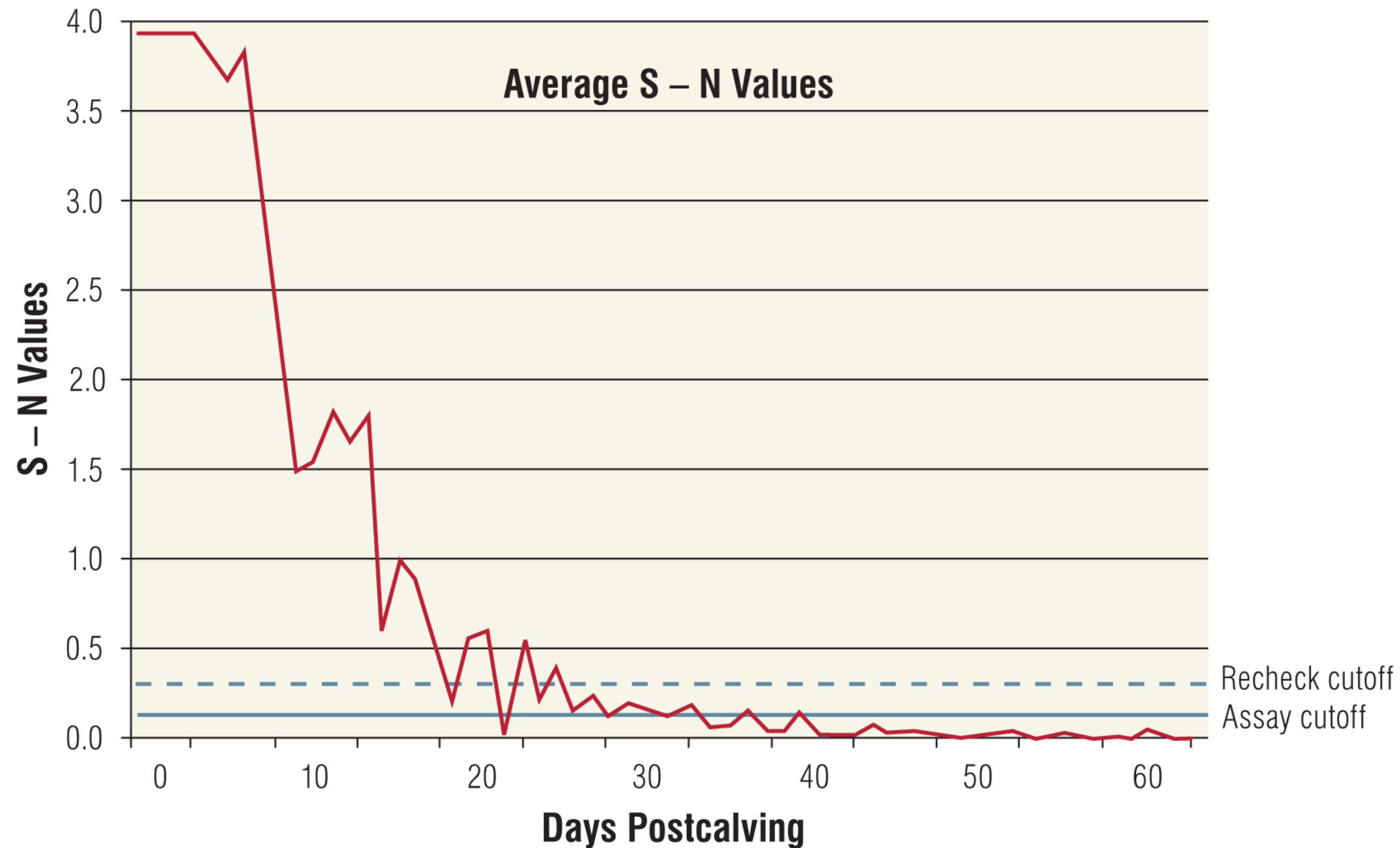
*IDEXX temporal study conducted on multiple cows throughout gestation (data in graph represents average S - N from a total of 12 cows).

†See IDEXX Milk Pregnancy Test validation report for full performance data.

IDEXX Milk Pregnancy Test

Post calving Decline in Milk PAG Levels

- PAG levels decline rapidly after calving
- Specificity of **100%*** by **8.5 weeks** (60 days) after calving



No interference when testing for the next pregnancy

*Specificity for sample population tested. See IDEXX Milk Pregnancy Test validation report for complete test performance data.

IDEXX Milk Pregnancy Test

Test Performance

		Ultrasound / Palpation	
		Pregnant	Open
IDEXX Milk Test	Pregnant	872	10
	Open	11	373

Sensitivity: 98.8% (95% CI, 97.7% - 99.3%)*

Specificity: 97.4% (95% CI, 95.2% - 98.6%)*

Recheck results: 4% of total tested (3% pregnant & 1% open cows)

Accurate confirmation of pregnancy status from day 35 post breeding and throughout gestation†

† See IDEXX Milk Pregnancy Test validation report for complete performance data.

* Recheck results are excluded from sensitivity and specificity calculations

IDEXX Milk Pregnancy Test

Benefits for the Dairy Farm

- Identify open cows and re-breed earlier to shorten calving interval and improve economic performance
- Timely identification of open cows and rapid re-breeding are key components of a successful reproductive program
- The highest rate of embryo loss occurs in early gestation however embryo/fetal mortality occurs throughout gestation
- Following early pregnancy detection, monitoring is necessary to find out quickly, if and when, a pregnancy is lost
- The economic impact of open cows in mid-late lactation is significant
 - Too late to re-breed
 - Declining milk production
 - Once dried off an 'open' cow is non-productive and use of dry cow therapy may prevent culling (knowing she is open prior to dry-off saves feed and drug costs)
- The IDEXX Milk Pregnancy Test offers a simple, convenient & cost-effective way to monitor pregnancy status of the dairy herd

IDEXX Milk Pregnancy Test

Why and How to Use

- Confirmation of early pregnancy diagnosis
- Adds value to existing milk recording samples for milk recording laboratories, veterinarians and producers
- Supports more frequent confirmatory testing in later stages of pregnancy, enabling timely identification of open cows
- Veterinarian input regarding reproductive management and result interpretation as well as investigation of non-pregnant cows, embryonic loss & abortion
- Simple, accurate, safe, hygienic
- Improve calving intervals & overall economic efficiency

**Complements Traditional Methods of Early
Pregnancy Detection**

Is laboratory based pregnancy diagnosis a good fit for your practice?

- Veterinarians who are interested in chemical pregnancy testing are interested because:
 - They can offer their clients more frequent confirmatory testing by using chemical based pregnancy tests in addition to palpation and ultrasound
 - They can have a technician visit the farm to collect the samples (or the producer can collect samples themselves), freeing up the veterinarian to focus on other veterinary activities
 - They can maintain a high level of accuracy, even when a large number of cows are tested at one time
 - Reduced physical wear & tear

IDEXX Milk Pregnancy Test

Laboratory Training and Support

- Key customers for the IDEXX Milk Pregnancy Test are milk recording (DHI) laboratories and veterinary clinics
- IDEXX can provide everything needed to set up your laboratory for pregnancy testing (blood or milk) supported by:
 - **International direct sales and distributor team**
 - » Local, dedicated sales support
 - **World-class technical services team**
 - » Assist in setting up the ELISA laboratory as required
 - » Provide training for your staff
 - » Ongoing troubleshooting and customer support
 - **Dedicated customer services team**
 - » Easy order placement process
 - » Rapid shipping from distribution centers

IDEXX Milk Pregnancy Test

Summary

- The IDEXX Milk Pregnancy Test can be used from 60 days post-calving and 35 days post-breeding
- Accuracy on par with alternative methods of pregnancy diagnosis
- Using routine milk samples offers a simple, cost-effective way to monitor pregnancy status in the herd
- Veterinarians play an important role in the design and implementation of herd reproductive management programs, including pregnancy diagnosis
- No single program will suit all herds
- PAG pregnancy testing (blood or milk) is another tool that veterinarians can incorporate into comprehensive systems for managing reproduction on farms

Thank you



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Thank you for attending today's Webinar:

The IDEXX Milk Pregnancy Test

Dr Christoph Egli - christoph-egli@idexx.com

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