



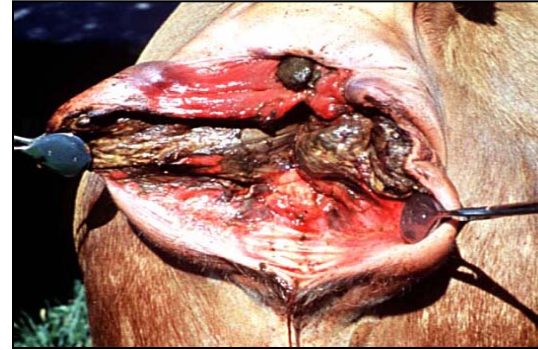
Klinik für Wiederkäuer  
mit Ambulanz und Bestandsbetreuung

## Prediction of parturition in cattle: Development of a Standard Operating Procedure (SOP)

D. Strey, C. Sauter-Louis, A. Braunert, D. Lange, F. Weber, H. Zerbe

# Dystocia

Incidence: 2 – 7 % Industrial countries (USA ~ 20%) (Mee 2008)



Economics: Up to 500,-€ per case (McGuirk 2007)

- Reduced production
- Fertility problems
- culling
- weakness of calves
- Veterinary costs (Lombard 2003, McGuirk 2007, Tenhagen 2007)



Can we improve the prediction of the calving-time?

Improved prediction of calving within the  
next 12 h in cows



Clinical examination

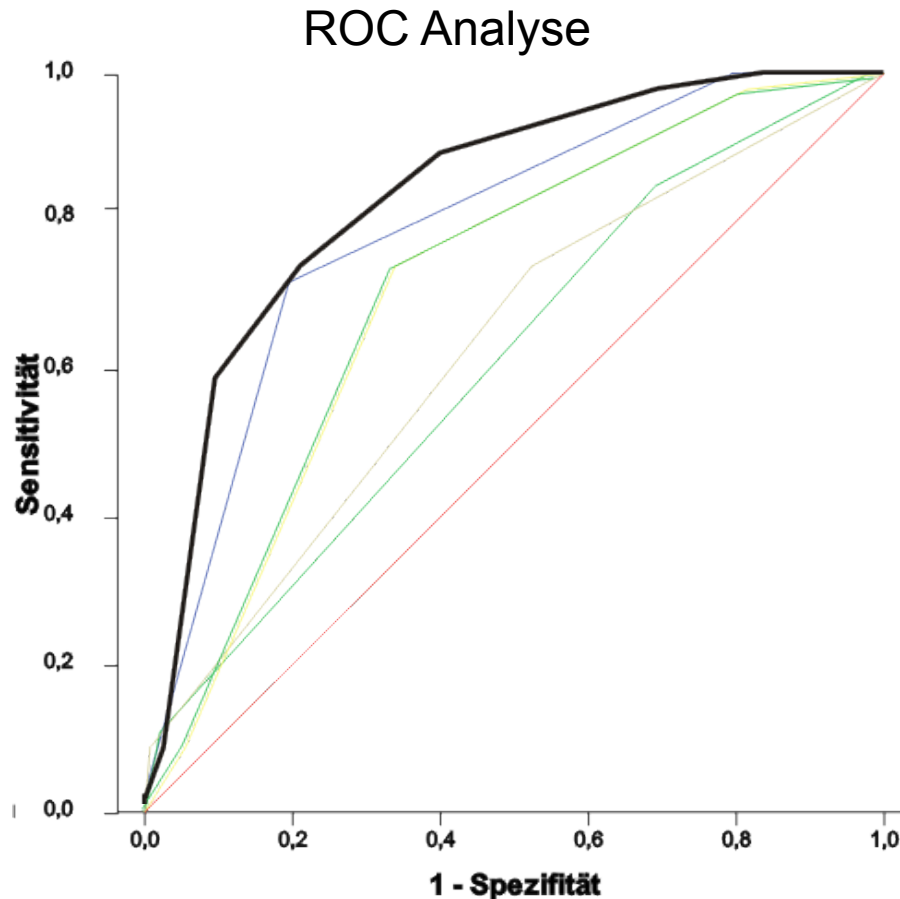


Progesterone

# Material und Methode

Clinical sign	0	1	2	3
Relaxation of the broad pelvic ligaments	Doubled value: 0, 2, 4, 6 !			
Secretion of vaginal mucous	none	slight	moderate	extensive
Enlargement of the udder	empty, small palpable	slightly filled	partially filled	totally filled, enlarged, not palpable
Oedema of the udder	none	on the base	entire udder	including the abdomen
Filling of the teats	flaccid	slightly filled	moderately filled	totally full
Relaxation of the tail	no flexibility	45° – 90°	90° – 120°	120° – 180°
Oedema of the vulva	strongly pleated, no oedema	moderately pleated, mild oedema	mildly pleated, moderate oedema	not pleated, strong oedema, redness

# Results: Clinical parameters



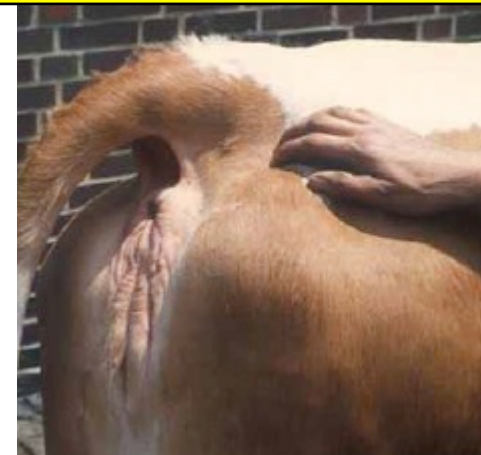
Parameter	Area under curve (AUC)
Pelvic ligaments (PL)	0.775
Teat filling (TF)	0.733
Udder enlargement (UE)	0.732
Vulva oedema (VO)	0.666
Tail relaxation (TR)	0.634
Udder oedema (UO)	0.624
Mucous secretion (MS)	0.578

Combination of parameters	AUC
PL+ TR + TF + VO	<b>0.811</b>
PL+ TR + TF	<b>0.819</b>
PL+ TF	<b>0.816</b>

Inter and Intra observer reliability (mean)		
	Inter	Intra
PL	0.864	0.868
TF	0.822	0.880
VO	0.415	0.048
TR	0.324	0.148

# Results: Clinical parameters

	Parameter / Scores							
broad pelvic ligaments	firm, no relaxation	0	mildly softened	2	totally softened, but palpable	4	totally softened, not palpable	6
teat filling	flaccid	0	slightly filled	1	moderately filled	2	totally full	3
<b>Total:</b>								



Cows and heifers (n = 124, breed: HF)			
< 5 points		< 4 points	
Sensitivity	73.9	Sensitivity	89.1
Specificity	78.9	Specificity	60.0
+ predictive value	21.5	+ predictive value	14.9
- predictive value	97.5	- predictive value	98.6

**Exclusion of calving 12 h!**

Improved prediction of calving within the  
next 12 h in cows



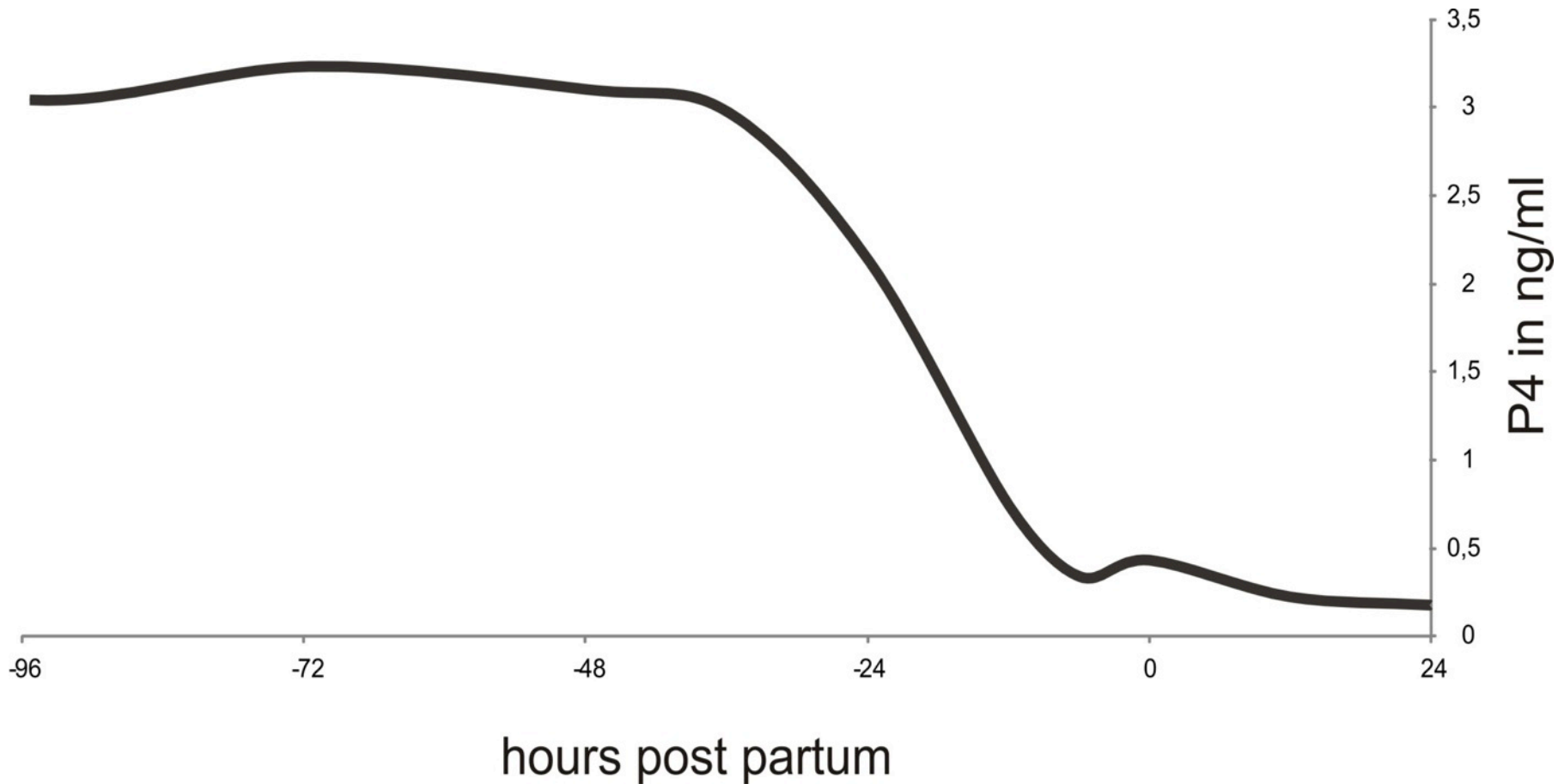
Clinical examination



Progesterone

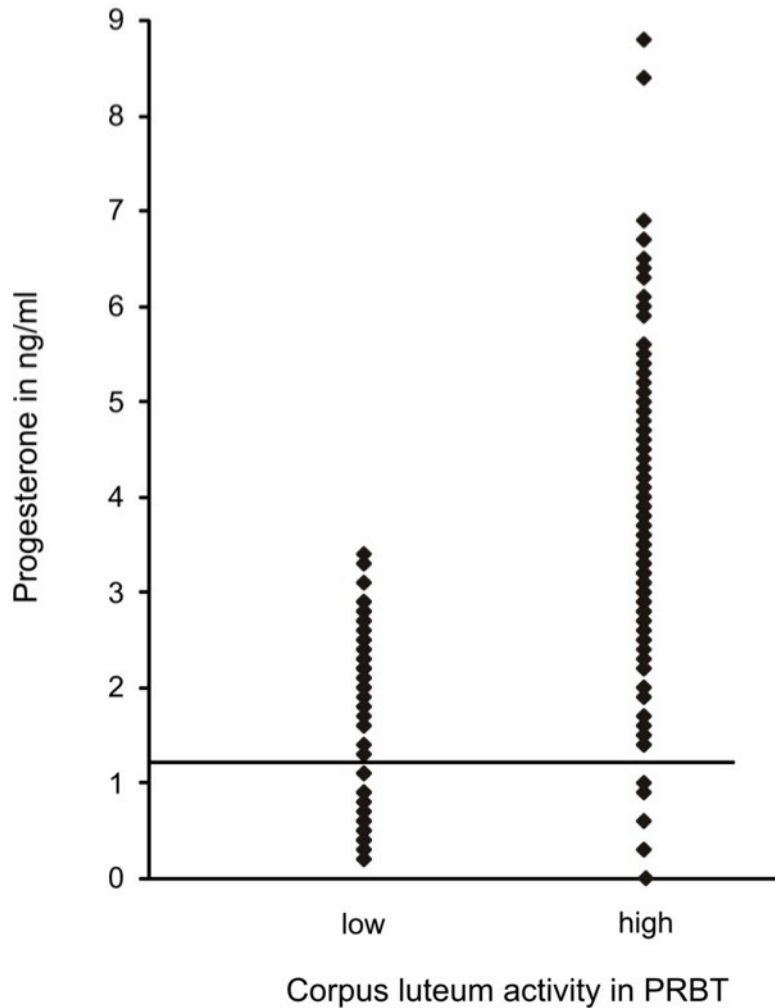
# Progesterone

## Physiological drop of progesterone 12 bis 48 h a.p.

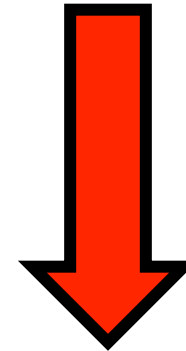


(Strey, unpublished)

# Results: Progesterone rapid blood test (n= 280)



Progesterone rapid blood test	
<b>Sensitivity</b>	<b>90.24</b>
<b>Specificity</b>	<b>74.89</b>
<b>+ predictive value</b>	<b>37.75</b>
<b>- predictive value</b>	<b>97.84</b>

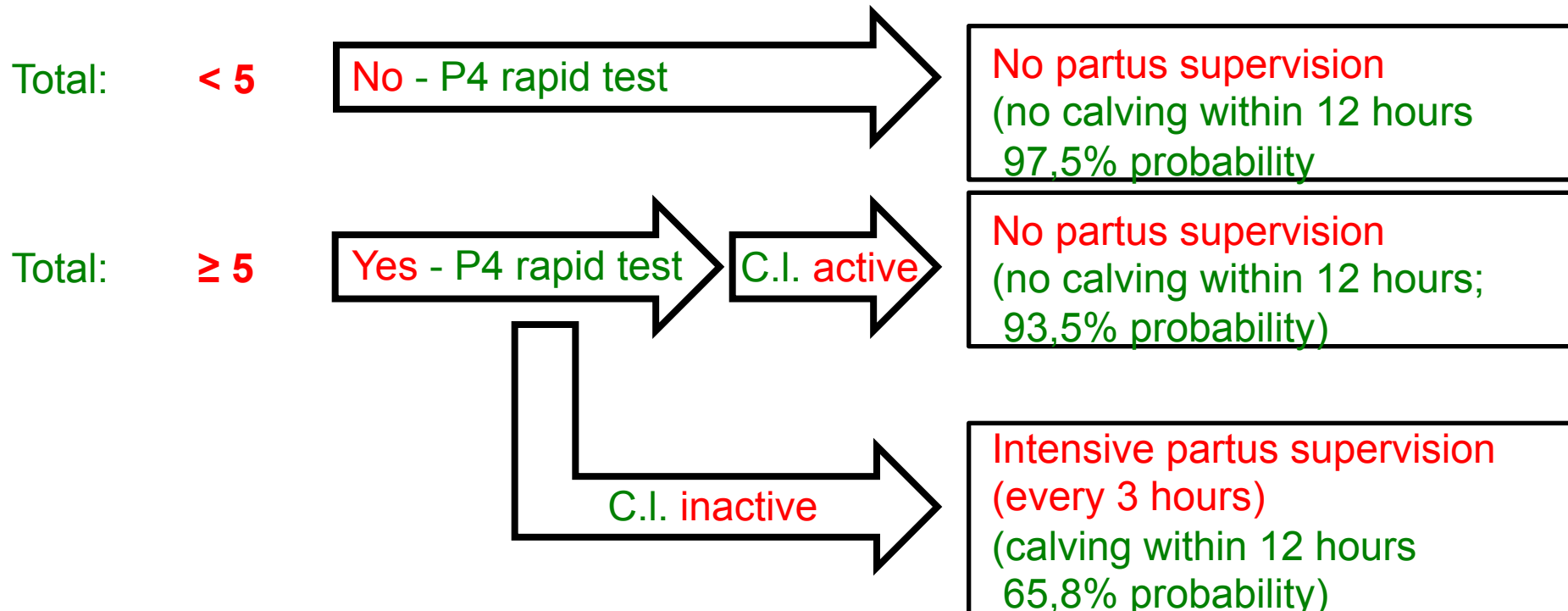


**High security for an active C.I. (P4 High)**

# SOP (based on clinical examination)



	Parameter / Scores							
<b>broad pelvic ligaments</b>	<b>firm, no relaxation</b>	<b>0</b>	<b>mildly softened</b>	<b>2</b>	<b>totally softened, but palpable</b>	<b>4</b>	<b>totally softened, not palpable</b>	<b>6</b>
<b>teat filling</b>	<b>flaccid</b>	<b>0</b>	<b>slightly filled</b>	<b>1</b>	<b>moderately filled</b>	<b>2</b>	<b>totally full</b>	<b>3</b>
<b>Total:</b>								



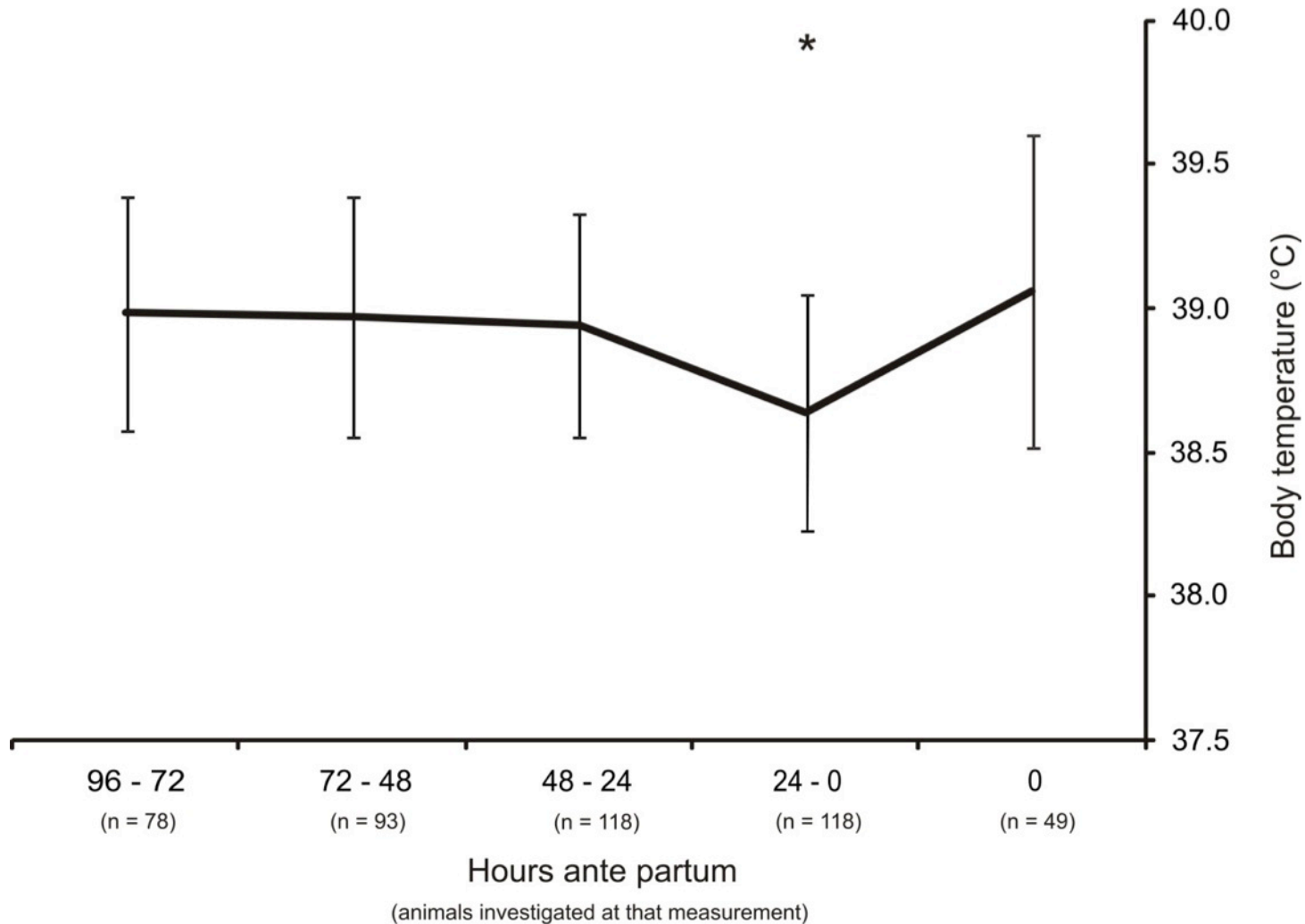
# Acknowledgement



Collegues Clinic for ruminants  
Milch und Mast Lübbinchen  
LVG Achselschwang

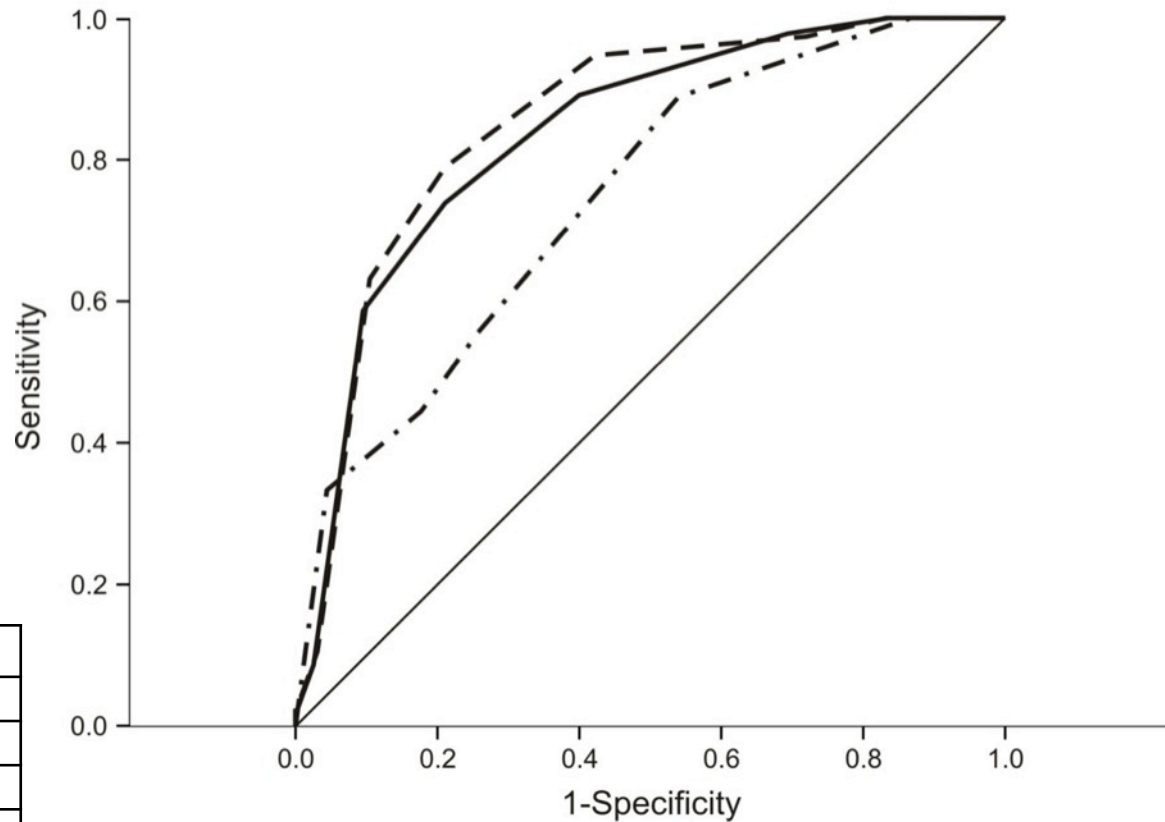


# Results: Temperature



Digital Thermometer (VT1831 microlife™, microlife, Switzerland).  
32.0°C to 42.9°C / Precision:  $\pm 0.1^{\circ}\text{C}$  between 34°C and 42°C.

# Cows vs. Heifers



<b>Kühe (n = 90)</b>		<b>Färsen (=34)</b>	
<b>≤5 Punkte</b>		<b>≤5 Punkte</b>	
Sensitivität	79.0	Sensitivität	44.4
Spezifität	78.7	Spezifität	82.3
+präd Wert	22.4	+präd Wert	16.7
-präd Wert	98.0	-präd Wert	94.9
<b>≤ 4 Punkte</b>		<b>≤ 4 Punkte</b>	
Sensitivität	94.7	Sensitivität	55.6
Spezifität	57.8	Spezifität	74.3
+präd Wert	14.9	+präd Wert	14.7
-präd Wert	99.3	-präd Wert	95.5

(Strey et al., JVS, accepted 2011)

(Strey et al., J Vet Sci 12 177-185)