

# Application of “Pregnancy Specific Protein B” Testing Technology in a Commercial Dairy

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## Abstract

Our world and particularly our profession changes around us daily. Regardless of whether we choose to embrace change, or choose not to embrace change, it will occur. Our physical features and abilities are constant reminders of change. This brief presentation addresses one practitioner’s attempt to keep up with change and stay ahead of the aging process. Data sets presented demonstrate current trends in lab testing for pregnancy diagnosis, as well as comparisons between laboratory results and rectal palpation. Protocols for personnel implementing synchronization and testing are discussed.

## Résumé

Notre monde, et particulièrement notre profession, évoluent tous les jours. Que nous choissions d’accepter ou non le changement, il arrive quand même. Nos caractéristiques et nos capacités physiques nous rappellent constamment que nous changeons aussi. Cette courte communication est la tentative d’un vétérinaire de s’adapter au changement et de prendre les devants sur son processus de vieillissement. Les informations présentées illustrent les tendances actuelles dans les tests en laboratoire de diagnostic de la gestation, ainsi que les comparaisons entre les résultats de laboratoire et ceux de la palpation rectale. Nous discuterons aussi des protocoles de mise en oeuvre par le personnel de la synchronisation et des tests.

## Introduction

Many of us can still vividly remember the summer of 1969 and the excitement of watching Neil Armstrong and Buzz Aldrin take a stroll on the moon. Some of the older generation never believed that this historic event was anything more than a television fabrication.

Technological advances in earlier generations occurred, but at a much slower pace than what it seems we are experiencing in this generation. Since the late 1960s, we have seen advances in technology at an unprecedented rate.

Our world and particularly our profession changes around us daily. My graduating class of 1986 has seen Brucellosis all but virtually eradicated in the US, bringing over 50 years of effort almost to fruition. For those of us in mixed practice, many of us “tube wormed” horses as a large component of our practice profile, a service that is now replaced by over-the-counter pastes. In the American Association of Bovine Practitioners May 2009 newsletter, the president’s message titled, “Embracing Technology” encourages members to visit the AABP website, a term and entity unheard of less than 20 years ago. Regardless of whether we choose to embrace change, or choose not to embrace change, change will occur.

## Use of Pregnancy Specific Protein Testing to Determine Pregnancy

The data set in Figure 1 (Doug Pals, BioTracking LLC, electronic communication) demonstrates the rate at which our clientele are adopting the pregnancy specific protein B testing (BioPRYN)<sup>a</sup> technology for pregnancy diagnosis via blood sampling. This presentation addresses one practitioner’s attempt to keep up with change and stay ahead of the aging process by adopting this technology in a commercial dairy. The protocol for implementing testing from a pragmatic timing and personal viewpoint are the emphasis of this presentation. Following is a summary of significant information for the dairy being discussed in this presentation:

- Southwest Oklahoma, dry-lot dairy
- Annual average total cows: 2,400
- Annual average lactating cows: 1,900
- 3X/day milking
- Test day average milk: 77 lb (35 kg)

Cattle Sample Wells Sold						
Year	2004	2005	2006	2007	2008	Apr 09
Total Biotracking and Affiliate Labs	52,830	85,034	207,199	336,731	498,115	168,083

**Figure 1.**

- Average SCC < 200,000
- 70-day voluntary waiting period (VWP)
- One primary breeder averaging in the mid to high 20's conception rate (CR) with 32% during ideal breeding conditions, and the low teen's during the heat of summer
- Annual herd pregnancy rate 18-22%

The protocol for implementing the testing procedure in Figure 2 is adapted from recommendations by the University of Missouri Veterinary Extension personnel (Scott E. Poock, DVM, personal communication) using heat detection and timed artificial insemination (TAI) with blood drawn at day 32 post-AI. Day-of-the-week timing is pragmatic for consistency and efficiency of labor.

All cows not visibly detected in heat at day 18-21 post-AI are prepared for re-synch with GnRH at day 25. Cows reported as "open" by the BioPRYN test are re-synchronized on day 36. Re-synchronized cows are bred on observed estrous until TAI at 72 hours. All cows reported as BioPRYN "open repeat", or BioPRYN "pregnant repeat", are palpated at the next scheduled veterinary herd check. All cows reported as BioPRYN pregnant are also verified at the next scheduled veterinary herd check. In this herd, since beginning BioPRYN

and verify palpations in June of 2008, two cows without obvious abortions have been reported as open at dry-off. The annual observed and apparent abortion rate in this herd averages 4.6%. Data sets from herd veterinary checks are compared to the BioPRYN results and recorded every two weeks. Results of the comparison are detailed in Figure 3.

At random intervals, 20 cows reported as BioPRYN "open" are palpated on veterinary herd check day prior to prostaglandin treatment. No BioPRYN open cows have been palpated pregnant. No measurable impact has been detected in first-service conception rate or percent pregnant after three services. Changes are measurable in percent pregnant by six services in first-lactation heifers. Changes are measurable in percent open at ten cycles in both first-lactation heifers and multiparous cows, as demonstrated in Figure 4 and Figure 5, respectively.

With a multiplicity of variables in the dynamics of a herd of 2,400, measuring the effect of a change in protocol can be challenging. Cause and effect relationships must be evaluated with caution. The management and consulting veterinarian in this herd evaluate the trends in herd data sets regularly. As long as the data sets are favorable for herd productivity and profitability, the protocols remain in place. If herd data support a nega-

<u>Sunday</u>	<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>	<u>Saturday</u>
		GnRH -10	-9	-8	-7	-6
-5	-4	Lutalyse	Observe Heats and A.I. -2	Observe Heats and A.I. -2	am GnRH & 1st TAI <b>DAY 0</b>	<b>1</b>
<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>
<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>
<b>23</b>	<b>24</b>	<b>Give GnRH</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>
<b>30</b>	<b>31</b>	Draw Blood - & Mail -- 32 - 38 Days since A.I.	Test arrive and run <b>33</b>	<b>34</b>	<b>Test Result Open 35</b>	<b>Lutalyse open BioPRYN 36</b>
<b>37</b>	<b>38</b>	Second TAI A.M. with GnRH <b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>
<b>44</b>	<b>45</b>	<b>Verify Pregnancy (+) on BioPRYN 46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>Draw blood for BioPRYN test from day 32 -39</b>						

**Figure 2.**

BioPRYN Analysis														
Date	Total Tested	Total Repeat	Reported as "Repeat" test result						Reported as "Pregnant"					
			Biopryn Pregnant	Palpation Pregnant	Biopryn Pregnant	Palpation Open	Biopryn Open	Palpation Open	Biopryn Open	Palpation Pregnant	Biopryn Pregnant	Palpation Pregnant	Palpation Open	
<b>Totals</b>	2504	126	62		21			26		17		1294	1235	56
						83					43			
% "Repeat"	5%	126	cows											
Average cost including repeat	\$ 2.37		% BioPRYN "Repeat" Pregnant Palpated Pregnant		% BioPRYN "Repeat" Pregnant Palpated Open		% BioPRYN "Repeat" open Palpated Open		% BioPRYN "Repeat" open Palpated Pregnant			% BioPRYN Pregnant Palpated Pregnant		% BioPRYN Pregnant Palpated Open
			75%		25%		60%		40%			95.4%		4.3%
														108

**Figure 3.**

2008 First Lactation	Avg. PP6C – 60.4%
	Avg. open at 10 cycles – 31.3%
2009 First Lactation	Avg. PP6C – 66.7%
	Avg. open at 10 cycles – 21.3%

**Figure 4.**

2008 2nd + Lactation	Avg. PP6C – <b>63.7%</b>
	Avg. open at 10 cycles – <b>24.4%</b>
2009 2nd + Lactation	Avg. PP6C – <b>66.7%</b>
	Avg. open at 10 cycles – <b>17.7%</b>

**Figure 5.**

tive trend, the most recent protocol prior to changing a policy or procedure is re-implemented. Since beginning BioPRYN testing in June of 2008, no negative impact on herd reproductive status has been observed.

### Conclusion

Adoption of new technology to determine pregnancy in the herd discussed in this presentation has had no negative consequences. Careful monitoring of outcomes is imperative when new technology is introduced into our practice or client's herds.

### Endnote

<sup>a</sup>Biotracking LLC. <http://www.biotracking.com>