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# How Do Crossbred Angus-Holstein Steers Compare to Crossbred Charolais-Holstein in the Feedlot?

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In the Imperial Valley of California, many feedlots are transitioning to feeding crossbred beef-on-dairy cattle in some part in the feedlot. This is due to the increase in use of beef semen on California dairies. The National Association of Animal Breeders reported that there was an increase of 718,000 beef semen units sold for use on dairies from 2021 to 2022. A recent survey of California dairies found that 81% of respondents used beef semen on their dairy cows.

To address this change, we published results looking at the performance of crossbred Angus-Holstein steers versus purebred Holstein steers in the feedlot in 2023. As a brief review, we found that Angus-Holstein crossbred steers were more feed efficient and had improved carcass characteristics compared to purebred Holstein steers. This information is important as these factors directly affect the cost of production and economic gains from the packing plant. We planned to expand this research to include another beef breed that is increasingly being used in dairy programs – Charolais. Through conversations with producers, we found that while most steers brought to the feedlots in Imperial County are Angus-Holstein crosses, a fraction of the cattle being fed are Charolais-Holstein crosses. Producers have voiced concern about Charolais-Holstein steers lacking marbling but had hope that the larger Charolais frame would improve production compared to Angus-Holstein steers.

The objective of this study was to identify productivity of Angus-Holstein steers versus Charolais-Holstein crossbred steers in the feedlot.

**Methods**:
Sixty Charolais-Holstein and 60 Angus-Holstein crossbred steers were brought to the feedlot at the UC Desert Research and Extension Center in Holtville, CA at approximately 286 lbs. Cattle were fed a steam-flaked corn-based diet and management was similar to local commercial feedlots. Weights were measured monthly, and carcass data were collected at the end of the feeding period - 301 days.

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## *In this Issue…*



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**Results**:
*Feedlot growth performance* – Angus-Holstein steers had a 4% greater final weight, 5% greater average daily gain, and 6% greater dry matter intake compared to the Charolais-Holstein steers overall. However, the gain to feed ratio for the two breeds was not different.

*Carcass characteristics* – Compared to the Charolais-Holstein steers, the Angus-Holstein steers had greater back fat thickness (26%), smaller ribeye area (4%), greater marbling score (9%), and lower preliminary yield grade (9%). See table one for details. There was no significant difference between breeds for liver abscesses, pinkeye, or morbidity.

Table 1: Feedlot performance and carcass characteristics of Angus-Holstein and Charolais-Holstein crossbred steers

| | Angus-Holstein | Charolais-Holstein |
|---|---|---|
| **Feedlot growth performance** | | |
| Final weight (lbs) ‡ | 1,430 | 1,375 |
| Average daily gain (lbs/d) ‡ | 3.34 | 3.19 |
| Dry matter intake (lbs/d) ‡ | 18.9 | 17.9 |
| Gain to feed ratio | 0.178 | 0.179 |
| **Carcass characteristics** | | |
| Hot carcass weight (lbs) | 910 | 887 |
| Dressing percentage | 63.4 | 63.7 |
| Back fat thickness (in) ‡ | 0.48 | 0.38 |
| Ribeye area ($in^2$) ‡ | 13.5 | 14.1 |
| Marbling score‡ | 5.19 | 4.76 |
| Preliminary yield grade‡ | 2.95 | 3.21 |
| **Health** | | |
| Liver abscess (%) | 20.8 | 20.1 |
| Pinkeye (%) | 12.5 | 6.25 |
| Morbidity (%) | 4.17 | 2.08 |

‡ Denotes statistical differences ($P \leq 0.05$) between breeds

**Take home**:
Angus-Holstein crossbred steers had increased performance and improved carcass characteristics compared to Charolais-Holstein steers, however feed efficiency and dressing percentage were not different between the two breeds. Continuing to build the database of crossbred beef-on-dairy cattle in the feedlot is critical as sire may play a significant role in productivity and efficiency, as has been seen in other studies.

*Finished Charolais-Holstein steer (left) and crossbred Angus-Holstein steer (right) one day before harvest.*

# Evaluating Passive Immunity in Calves: Time Matters!

*Rúbia Branco-Lopes – UCCE Tulare, Kings & Noelia Silva-del-Río – UC Davis & UC ANR*

The significance of colostrum management for newborn calves is well recognized. Since calves rely on maternal immunoglobulins (IgG), it is crucial to administer high-quality colostrum in adequate amounts promptly after birth. This ensures the transfer of passive immunity (**TPI**) to safeguard the calf from pathogens and prevalent diseases. Historically, the benchmark for categorizing dairy calves as having adequate passive immunity or experiencing a failure in passive immunity transfer was set at serum IgG levels above or below 10 mg/mL for calves aged 24 to 48 hours. This standard significantly reduced mortality among heifer calves over the past decades. However, calf morbidity rates in the United States have not seen a similar decline. In response, Lombard et al. (2020) proposed new TPI assessment guidelines (for more information on this, check this newsletter article; volume 12, issue 2, 2021). The new TPI assessment guidelines were developed to be used in calves from 1 to 7 d of life using direct and indirect methods.

To investigate how the timing of blood sampling impacts TPI categorization, we studied the dynamic of serum IgG and total protein (TP) in dairy calves during the first two weeks of life. In a commercial heifer raising operation, 36 calves (19 Holstein, 17 Jersey) were sampled immediately after arrival (d 1) and at d 4, 8, 12 and 16 of life, for serum IgG and TP concentration. TPI was categorized as described in Table 1.

**Table 1.** Categories of transfer of passive immunity (TPI) based on IgG and TP levels

| Category | IgG (g/L) | TP (g/dL) |
|---|---|---|
| Poor | <18 | <5.8 |
| Good | 18 to <25 | 5.8 to <6.2 |
| Excellent | ≥25 | ≥6.2 |

**IgG concentration.** Overall, we observed a decline in serum IgG concentration over time. By day 16, IgG levels in calves with Excellent TPI had fallen by 40.2%, and those with Good TPI by 28.2%. The observed decline in serum IgG concentration over time is likely explained by IgG being metabolized or used in response to environmental immunological challenges.

**TP concentration.** Similar to findings for serum IgG, serum TP concentration also decreased over time. Total protein concentration dropped by 31.6% for calves categorized as TP-Excellent on day 1, 21.0% for those in the TP-Good category, and by 15.0% for calves considered TP-Poor.

Distribution of TPI classification over time based on serum IgG and TP concentrations is presented in **Fig. 1**. Our observations indicate that serum IgG and TP concentrations decline over time, which means the number of animals in each TPI category varied depending on the timing of blood collection.

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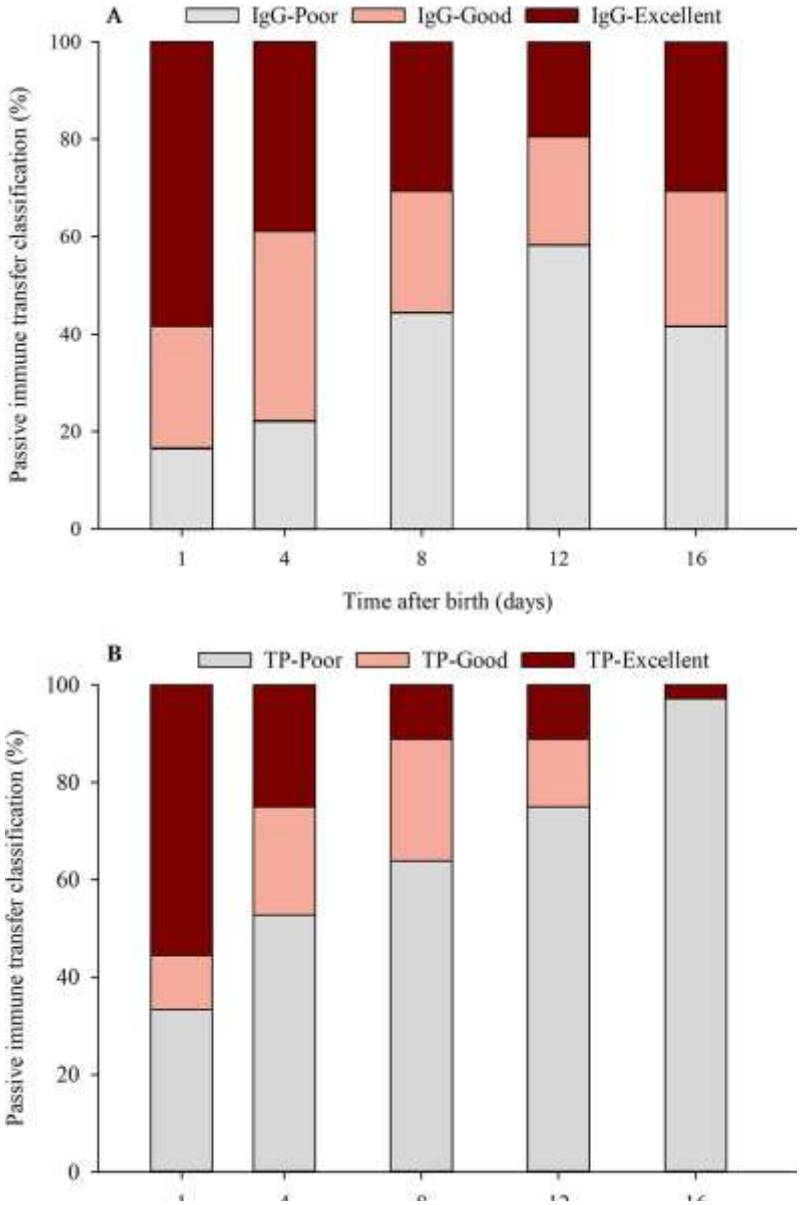


**Fig. 1.** Passive immune transfer classification (%) within 16 d of life based on (A) serum IgG concentration and (B) total protein.

**Take-home messages**:

- Blood samples should be collected 24 hours after birth to reflect the true absorption of IgG.
- Current TPI classifications should be interpreted carefully when calf age is unknown.

**References:**

Correa, A., Silva-del-Río, N., Branco-Lopes, R., Ferreira, F., & Valldecabres, A. (2022). Dynamics of serum immunoglobulin G and total protein concentrations in dairy calves during the first 2 weeks of life. *JDS Communications*, *3*(6), 416-420.

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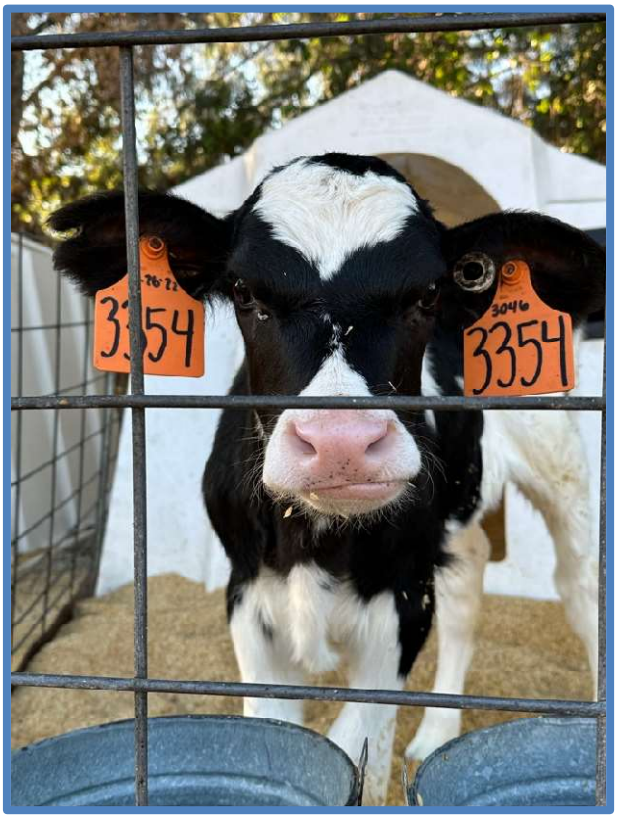

# There's a technology. Do I want it?

*Deanne Meyer – UC ANR & UC Davis*

The answer to that question will range from yes, to maybe, to no. Let's focus on how you determine the appropriate answer for your dairy and for EACH technology.

Identify what you need. I'm considering a technology because I want to _____. What do you want to do? Do you want to improve management of solids, nitrogen, carbon, phosphorus or something else? Is information available on the technology to identify if it accomplishes what you want it to do? Standardly, this is third party tested (often a university) results. Look at how reliable the technology was during testing, as well as the duration of testing, seasonal influences, and number of samples taken. Understanding performance variability is critical BEFORE installation.

Step 1. Identify success. If this technology is installed and functional 100% of the time it will help me better manage _____ .

This step also suggests identifying ahead of time what level of operation is necessary for the technology to be deemed a success. That may be determined as removal of nitrogen or phosphorus by 50% from a waste stream. This thought process provides a means to effectively evaluate the technology once installed to measure its performance.

Step 2. Compare technology claims and research findings with your definition of success. If what it does isn't what you need, NO SALE!

Step 3. Do your homework! It's road trip time. Invest time to see the technology in action even if it is functioning out of state. Rely on your network to identify where it may be installed and have a heart-to-heart conversation with the manager. Ask questions about maintenance, repairs, unexpected/unanticipated challenges. My favorite is, "if you started now with all you know, how would you improve the installation and operation"?

Step 4. Understand your regulatory approval process, the build process disruptions, and the operation and maintenance activities. How much lead time is needed to procure regulatory permits (San Joaquin Valley Unified Air Pollution Control District, Regional Water Quality Control Board, and County Planning Department)?

Step 5. Analyze and question all things operation and maintenance. That includes availability of parts, technical assistance within 24 hours, and necessary adjustments for adverse weather conditions. It's important to understand what it will take to have the technology operational 24/7/365.

Step 6. Understand how the waste stream is managed if the technology fails. This could be weather induced, an electrical outage, broken components, etc.

Step 7. Read fine print of all contracts and have a lawyer review if there are any strings attached to the technology. Be sure you have control of your herd and its management. Be sure you don't have to keep making milk if the milk market is upside down. Understand if incentives are insets or offsets.

Step 8. Assign one person to interact daily with contractors during the build process. This ensures everything is built as designed and fewer challenges occur. It is critical to check-in daily.

Step 9. Expect modification and analyze appropriately.

Stepp 10. Enjoy the working of your new technology.