

GRASS-FED BEEF: A DRY-WET AGE COMPARISON

THE UNIVERSITY OF ARIZONA FOOD PRODUCT AND SAFETY LAB

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Tenderness is a primary factor that consumers relate to meat quality. Tenderness can be greatly increased by aging beef. The aging of beef has been used in the industry for many years. Traditionally a method of necessity, aging was a product of marketing. The animal was retained as long as necessary to sale the product. In contrast, the main reason for aging today should not be a surprise to anyone: customer acceptability of the product. Consumers find that aged beef is more tender and has a more beefy flavor than non-aged beef. There are two methods of aging beef: wet age or dry age. The names themselves are intuitive - in wet aging the product is aged in a sealed package which holds in all moisture, in dry aging the carcass or a portion thereof is aged in refrigerated open air. According to consumers, there is a difference between the two: dry aging has a brown roasted beefy flavor, while wet aged beef is said to have a metallic flavor.

Dry aging of beef is largely done to improve tenderness and flavor. High end restaurants age their beef up to a month or longer to appeal to customer demand and to achieve the recognition that comes with dry aged beef. The dry aging of beef requires significant space to allow the carcasses or portions thereof to age for an extended period of time in refrigerated air. To combat the cost of dry aging many producers and/or retailers will only age portions of the carcass such as the rib and loin which are the higher valued cuts and those more preferred by customers with preference for dry aged products.

Wet aging is the most common way of aging today. Largely all beef harvesting facilities will fabricate their carcasses into boneless or semi-boneless primal cuts prior to shipping. This greatly reduces associated shipping costs. These primal cuts are vacuum packaged which allows for aging to occur when beef is in transport and while it is being stored at markets and restaurants prior to retailing. This also has streamlined the retailing of beef as those working in retail no longer need to possess the skill set of fabricating whole animals. Rather, they simply open packages, make cuts and re-package. The preceding does outline, however, an additional cost associated with wet aging, that of multiple packaging.

There are positive and negative aspects to wet and dry aging. Wet aging requires less area to store the cuts, is easier to transport and is cheaper for most facilities. Although the packaging costs are higher due to packaging for the aging process, the chance of contamination is reduced due to oxygen reduction. Another positive aspect to wet aging is the reduction of carcass shrink that occurs with dry aged beef. However, wet aging has a purge loss associated with it, this is the loss of juices which purge from the primal

while under vacuum in the vacuum package, negating the benefit of reduced carcass shrink. Also, as mentioned before consumers find wet aging to have a metallic aftertaste. Dry aged beef may require more area for the dry aging processes. However, the flavor profile is highly acceptable among some consumers. These consumers are willing to pay the additional cost associated with this method of aging, compensating the producer for their investment.

While most of the beef sold in the United States is grain fed, there is a consumer demand for locally raised grass-fed beef. This is driven by the idea that grass-fed cattle are better for the environment and for human health. A significant concern that comes to light when considering grass-fed beef, is the issue of tenderness and different flavor profile. This stems from its inherent differences to grain-fed beef. The use of dry and wet aging can be extensively used on grass-fed beef to increase consumer acceptability of the product by tenderizing it and making it more flavorful.

Local Research

A study was developed at the University of Arizona's Food Product and Safety Laboratory to compare both aging methods in grass-fed beef, involving a total of 14 grass-fed steers. At the time of harvesting hot carcass weights (HCW) were recorded on all carcasses prior to chilling. Forty-eight hours post harvesting all left sides of carcasses were weighed and fabricated into primal cuts with each primal cut being individually weighed prior to vacuum packaging. These packages functioned as a wet age comparison to their dry aged counter parts. After fourteen days of aging the packages were opened to exclude purge loss and weighed to provide for a measurement of the loss. The same day, all right sides were weighed to record carcass shrinkage, and then likewise fabricated into primal cuts. In this comparison no statistical significance was seen between the aging methods with regard to weight loss of primal cuts. A comparison of the

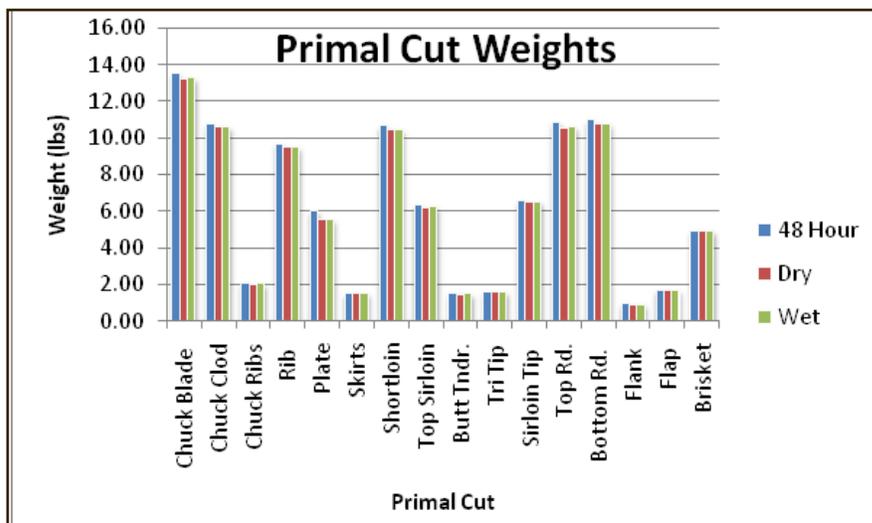


Figure 1: Comparison of primal cut weights of sixteen major primal cuts between various methods/times of aging beef.

primal cut weights Figure 1.

Shear force values were also collected at 48 hours post-harvesting as well as for the 14 day wet and dry aged samples. These values were collected from a sample of the loin eye collected from the twelfth rib. This loin eye sample was cooked to an internal temperature of 160°F and then cooled to room temperature. Half inch core samples were taken and sheared in a Warner-Bratzler Shear, which measures the pounds of force required to shear the core sample. These samples again showed no significant differences between wet and dry aging. Those values in Figure 2.

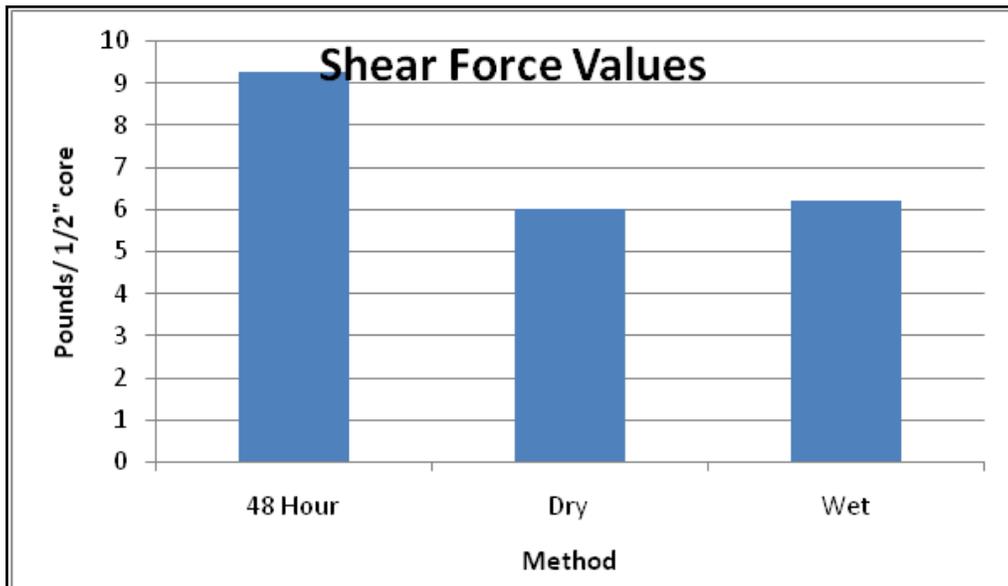


Figure 2: Comparison of shear force values measured in pounds/half inch core of loin eye muscle between various methods/times of aging beef.

Conclusion and Discussion

Undoubtedly the majority of beef consumed by Americans today is wet aged. However, there exists a small niche market of consumers who prefer and are willing to pay for the flavor and desirability of dry aged beef. From the research conducted at the University of Arizona it appears that there is little difference between the two methods of aging and their resultant product, from the standpoint of pounds of saleable product and shear force values. It is abundantly clear that aging of either method significantly decreases shear force value, or stated differently,

significantly increase tenderness. The decision making criteria in deciding which method should be used needs to be consumer driven. Knowing consumer preferences and catering to those preferences will likely ensure that the product delivered is well-received and desired.

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