

**Department of Agriculture, Trade and Consumer Protection
Division of Agricultural Development
Agricultural Development & Diversification Program (ADD)
Grant Project Final Report**

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Screening Procedures for Premium Cheese Selection For Affinage

by:Mary Falk

When deciding which cheese to select for affinage, the “healthiest” cheese always makes the best candidate.

If the cheese does not have a good physical baseline at the beginning of the aging process, the results will not only be varied but also may potentially become a dismal and expensive failure.

Due to the variables present in the different varieties of cheese, it needs to be the cheese maker’s responsibility for the screening process of the cheese for potential affinage candidates. If the affiner were to screen the cheese, the affiner would then be put in the position of conducting lab tests that could be considered to be arbitrary, thus demanding the involvement of a certified lab for verification testing, all of which adds up to costly time and labor, greatly increasing the affinage costs.

However, if the cheese maker assumes the responsibility for screening his/her cheese for the best affinage properties..then it is predetermined that the costs and responsibility rests with the cheese maker who will typically already have the pertinent information readily at hand, and after reviewing the requirements for premium aged cheese, will have a better understanding of the properties needed for a quality aged product.

The cheese can then be pre designed to fit the standards, instead of trying to find a cheese that meets the affinage criteria after the fact.

Even though the responsibility of screening belongs to the cheese maker, it behooves the affiner to also screen incoming cheese for pH levels, if for the simple reason to verify the pH submitted by the cheese maker and to account for any deviations that may have occurred during shipping.

I have included a detailed explanation (courtesy of Rane May), which discusses the reasons for the selection criteria in the accompanying graphic.

The pH levels described here are of the pH of the cheese when it ENTERS the cave, not the pH at the time of make, meaning: a cheese that possesses premium pH values is not the same cheese if it has been held for an additional 6 months (or other amount of time) before being consigned to affinage since the pH values change during that time.

During the past 14 years I have cave aged a multitude of different cheeses from different sources of milk including cow, goats and sheep milk. The two most influencing factors for all of the cheese has been:

#1: The pH of the incoming cheese

#2 : The Moisture Content of the incoming cheese.

When the cheese has a pH above 5.1 coupled with a higher moisture content, the results for affinage can be tenuous at best, however, if the cheese has a higher moisture content but also contains a lower pH such as 4.9, the chance for successful aging is greatly improved. I have witnessed cheeses that were so high in moisture that once released from their plastic shroud and nakedly exposed to ambient temperatures, they promptly morphed from an 8 inch wide, 4 inch high wheel of cheese to a diameter of over 10 inches with a height of 2 inches...and the cheese still aged out with a very pleasant flavor profile, even though it had a markedly different appearance than the cheese maker had originally intended.

The reverse can also be said to be true; the drier the cheese, the greater the tolerance for higher pH values.

I can discuss ad infinitum the various different forms that cheese can present itself and the “fudge” factors that can allow for different results, but that would just add to the confusion instead of simplifying and increasing the likelihood for positive results for affinage selection . Over the course of time, experience will be the guide to cheese maker and affineur alike as to the limits of the “sense of humor” that a particular cheese has for affinage.

If the cheese is of the cheddar variety, whether pasteurized or made from raw milk, I highly recommend that the cheese be first aged at lower temperatures of approx 40-42F for no less than one month before the affineur receives the cheese. This small delay in exposing the cheese to the ambient temperatures will ensure that any possible coliforms will have had a chance to slowly degrade before being exposed to higher cave aging temps, decreasing the possibility of any off flavors or textural defects from developing.

The best determining factor to predict the likelihood of “premium” success for any cheese, is if the cheese is screened for a pH value of a minimum of 4.9 and not higher than a 5.1 with the appropriate moisture content for the standard of identity of that cheese. The more range is given to the cheese outside of that spectrum, the more likely that the flavor and texture profile of the cheese may be compromised. Not only is the flavor compromised, but when a cheese with an elevated pH content enters a cave aging facility accompanied by higher moisture levels, the likelihood that developing a healthy rind for the cheese will be greatly decreased due to excessive *brevibacterium linens* development.

This is especially true of pasteurized cheeses and a very important consideration when cave aging pasteurized goat cheeses.

The higher amount of B casein in goat cheese is especially susceptible to the pasteurization process and as a result will cause the cheese to hold onto moisture as the aging cheese's pH rises, allowing for a very active establishment of *Brevibacterium linens* which will turn a typical affinage scenario into a affineur's nightmare; At the age of between 3- 4 weeks the cheese will become a high maintenance "Prima Donna" of sorts and start to demand daily turning instead of once a week turning, resulting in not only a severe financial drain on the affineur, but also an end product with an altered flavor profile, along with being potentially difficult to manage for the resulting life of the cheese.

When accepting any pasteurized goat cheese, I highly recommend drying down the cheeses (either with fans or in a dry down room) for a period of at least two days before placing the cheese in the aging rooms. It is extremely important for the cheese maker to disclose to the affineur before the aging process begins, whether the goat cheese is truly made from raw milk or pasteurized milk.

In addition to goat cheeses, any cheese that is unusually wet would also benefit from a day or two of additional drying before being placed on the aging rooms shelves.

In considering the end result desired, it is beneficial to remember that the moisture content of a cheese aged for a lengthy period of time can possibly be reduced in moisture by approx 25 %. I have had the best results by reducing the "regular" salt content of the cheese by 25% for cheese destined for the cave, even if the cheese is aged for only a few months. It is best to experiment with smaller batches of cheese with varying salt contents to determine the best ratio for the particular cheese style before investing in aging larger batches. When "premium" qualifying cheese has been consigned I have found that those cheeses have a greater tolerance for salt level variation, meaning: a cheese that may have otherwise been found to be too salty after aging was still acceptable if it originally fit into the premium cheese guidelines for pH and moisture as seen in exhibit "B"

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The following time tracking data summary is based on the first month of aging a cheese, which is the most labor intensive part of aging a cheese. After the first month, the labor required for the average cheese is equivalent to the labor necessary as quoted for the 4th week of aging of the cheese as listed in the Time Tracking Summary.

The Time Tracking Summary does not include time spent for invoicing or for shipping product out. There is a wide variable per individual situations regarding technology used for office equipment and for shipping styles and supplies.

The aging contract allows for charging shipping costs separately from the direct aging costs. I have found that this has been the best system to use since the style of cheese will dictate the use of different shipping supplies and the time required for packaging will vary according to size, shape, moisture content of cheese and temperature and consignors' needs. To charge for shipping labor and supplies on a "per needed basis" is one of the best ways to prevent yourself from undercharging for your labor and supplies and to allow flexibility for shipping needs.

Time tracking of 1,000 lbs of cheese "cave aged" per man hour for the first month of aging cheese:

	Hours	Minutes
Bring cheese into aging area:		5
Remove cheese from boxes, remove cheese from plastic, weigh and record weights:	2	
Place cheese on shelves		30
Clean up plastic		5
Break down boxes		30
Dispose of plastic		5
<u>Total man hours for Receiving Cheese:</u>	<u>3.25</u>	

**(if needed) Place cheese on racks to dry down (extra 1/2 hour)*

**allow extra time to operate skidster or other such type of equipment for unloading larger shipments of cheese from semi trucks.*

Turning cheese on shelves per 1,000 lbs of (healthy)cheese:
(turning cheese includes cleaning of aging shelves)

	Hours
First Week	5
Second Week	5
Third Week	2.5
Fourth Week	2.5
Aging room cleaning per 1000lbs (monthly)	2
<u>Total man hours for Maintenance:</u>	<u>17</u>

Allow approximately 1 minute man hour labor per lb of cheese for monthly maintenance for typical cheese not requiring extra affinage skills (such as washing of rinds etc).

Aging Cheese Needs Attention to Details

By: Rane May

To make a firm-bodied, long-hold style cheese it is important to monitor several different aspects of that cheese. To start with, the original milk must be of good bacterial standards as well as low somatic cell counts.

If sufficient acidity is not developed and the curd is firm, it will break down slowly, if at all, and may never develop the desired flavor and body. Firm, corky-bodied, loose textured cheese is difficult to age.

Cheese with moisture content of 34 percent or lower may develop more acidity than is ordinarily recommended for the finished cheese. This cheese will have a short, brittle, crumbly body and is frequently open-textured with a sharp flavor.

When a normal amount of acidity is developed in proportion to the moisture content, the cheese will develop a pleasing full flavor. The proper amount of acidity depends not only upon the moisture content but also upon the time schedule allowed for making the cheese. The total quantity of acidity produced is as important as the rate of acid production. As the time is reduced from setting to packing, so is the over-all quality reduced.

Low-moisture cheeses are being under 36.0 per cent moisture. High-moisture cheese would fall within the range of over 36.0 to under 39.0 per cent moisture. These are arbitrary divisions in that a cheese at 36.5 per cent is not particularly high in moisture content. If properly produced the cheese would cure satisfactorily and probably not be distinguishable from others.

The Salt to Moisture Ratio (S/M) is an important tool that the cheese maker may use. S/M measures the dissolved salt in the water phase of the cheese. The water acts as a catalyst for enzymatic reactions in the cheese aging process. These values are directly related to the moisture in the nonfat solids (MNFS). The ratio of moisture to nonfat substances ideally should be around 53%. If that ratio is of a higher percentage, the faster the breakdown of the cheese during aging. This may be calculated as:
$$\text{Moisture} / (100 - \text{Fat}) \times 100 = \text{MNFS}$$

Fat in the cheese helps to give mouthfeel, flavor and elasticity of cheeses. Fat in the Dry Matter, (FDM) is used to help meet standards of identity for cheese as well as decisions on aging.

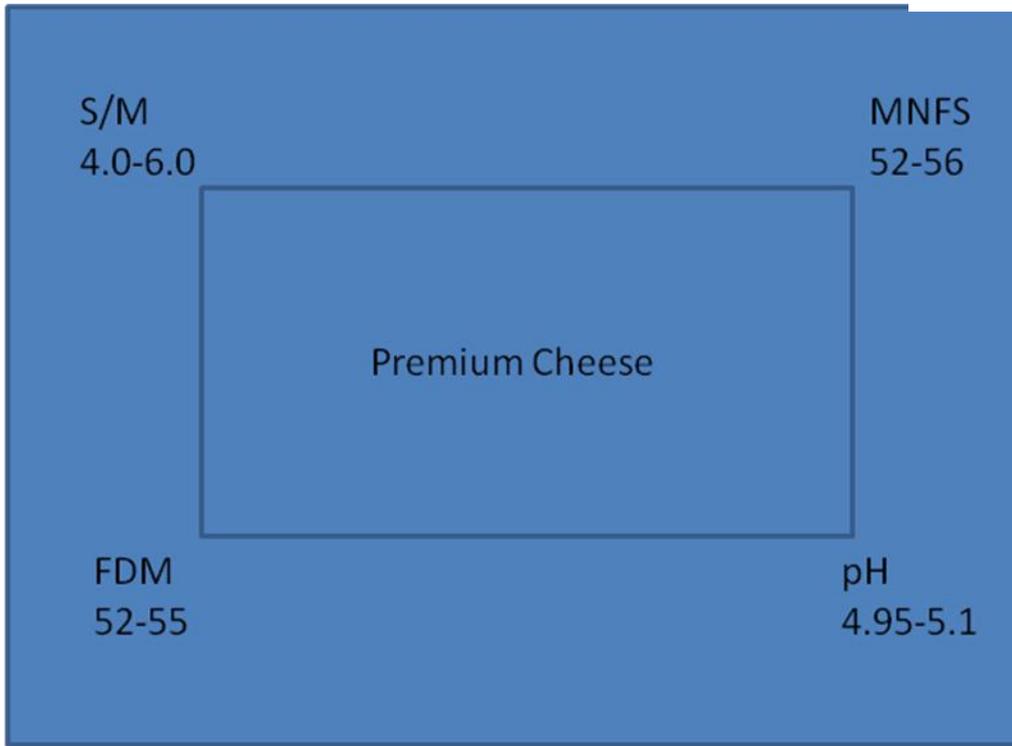
Ideal pH values should be pH <4.95, with the most ideal at 5.0-5.2. These values assist in the determination of cheeses that will meet acidity values and have the greatest potential for aging.

See attached chart for characterization of aging cheese. The inside box labeled premium cheese would be the ideal parameters for aging cheeses.

Exhibit "B"

S/M
2.5-6.0

MNSF
50-57



FDM
50-56

pH
4.85-5.2

AGREEMENT FOR AFFINAGE SERVICES

(Exhibit A)

This Agreement for Affinage Services (“Agreement”) is made this ____ day of _____, 20__ by and between _____ (hereinafter called “Affineur”) and _____ (hereinafter called “Consignor”).

WHEREAS, Affineur is the owner of certain caves used for the purchase of aging cheeses and rents said cave space to various cheese makers for the purposes of aging said cheesemakers cheeses.

WHEREAS, Consignor is desirous to rent from Affineur certain space in Affineur’s cheese caves subject to the terms and conditions hereinafter.

NOW, THEREFORE, in consideration for the mutual promises and benefits set forth, the parties agree as follows:

1. **Cheese Caves.** Affineur is the owner of certain cheese caves located at _____, Wisconsin (hereinafter “Cheese Caves”). By entering into this Agreement, Consignor wishes to utilize Affineur’s Cheese Caves and services (collectively the “Affinage Services”) subject to the terms and conditions set forth in this Agreement.

2. **Prices.** The prices for the Affinage Services to be provided by Affineur are set forth as \$._____per pound for affinage services and are based upon a one-month rental of space in Affineur’s Cheese Caves. There shall be no proration of any monthly rental charge. . If Consignor’s product is in Affineur’s Cheese Caves for any day of any month, then Consignor is responsible for the entire monthly charge.(similar to renting an apartment or monthly storage space). The parties herein agree that the prices agreed to are based upon the incoming weight of Consignor’s cheese and that said incoming weight shall constitute the price to be paid by Consignor throughout the entire time period in which Consignor’s product is in Affineur’s Cheese Caves.

3. **Packing and Shipping.**

A. Packing. Consignor shall pack, label and prepare its products for shipment to Affineur in accordance with its standard practices and procedures. Consignor shall also be responsible for packing and labeling costs of its product before it leaves Affineur’s cheese caves. Consignor herein agrees to pay Affineur at the rate of \$_____ per actual man hour for the labor provided for packing and shipping.

B. Shipping. Consignor shall arrange and pay for shipment of its products both to and from Affineur’s cheese caves.

- C. Risk of Loss. Risk of loss of Consignor's products shall stay with Consignor during the entire period in which Consignor's product is within Affineur's cheese caves.

4. **Terms of Payment.** Payment for the Affinage Services to be provided by Affineur herein shall be paid by Consignor in advance beginning with payment for the first month's services to be made on the date the cheese is shipped and/or delivered to Affineur. Thereafter, Consignor shall pay to Affineur the monthly charge as determined by the parties herein on the first day of each month. If Consignor fails to pay any charges due under this Agreement when the same is due, the unpaid amount shall, at Affineur's option and without waiving any other right of Affineur bear interest from the due date to the date of payment at the rate of interest of ___% per annum.

5. **Lien/Effect of Nonpayment.** The parties herein agree that they have had the opportunity to review Chapter 171 of the Wisconsin Statutes and hereby waive its application to the terms and conditions of this Agreement.

- A. Lien. Consignor hereby gives to Affineur a lien on Consignor's products being delivered to Affineur. Said lien shall be in an amount of all charges for the Affinage Services provided, as well as any and all shipping costs, applicable brokerage fees, attorneys fees and other charges incurred by Affineur as it relates to Consignor's products under this Agreement.

- B. Effect of Nonpayment. If at any time Consignor is past due on any invoice for a period of over 30 days, the parties herein agree that Affineur shall have the right to sell enough of Consignor's product to pay for the charges in said invoice. Said sale may be by either public auction, or by private sale. Affineur herein agrees to provide Consignor with at least ___ days written notice prior to Affineur's sale of Consignor's product in order to give Consignor the opportunity to pay off the invoice in full prior to the time of the sale.

If at anytime Consignor is past due on any invoice for a period of over 60 days, the parties herein agree that Affineur shall have the right to sell any and all of Consignor's product in Affineur's Cheese Caves subject to said invoice. From the proceeds of the sale, Affineur shall have the right to retain any and all funds due it for payment of the past due invoice, plus all costs and attorneys fees incurred by Affineur in selling said product. The balance of said proceeds, if any, shall immediately be paid to Consignor along with a copy of the terms and conditions of Affineur's sale of Consignor's product to a third party. Affineur may not sell Consignor's product until after Affineur provides Consignor with at least ___ days written notice prior to Affineur's sale of Consignor's product.

6. **Scheduling.** Consignor shall give Affineur at least ___ days notice regarding any shipment that is to be delivered to Affineur's Cheese Caves. Furthermore,

Consignor shall provide Affineur with at least ___ days notice prior to Consignor's pickup of any cheese from Affineur's Cheese Caves. If Consignor's shipment constitutes over ___ pounds of product, then a ___ day notice is required.

7. **Warranties.** Affineur makes absolutely no warranties of any kind as it relates to the quality of Consignor's product delivered to Affineur's Cheese Caves. Specifically, Affineur makes no warranties of any kind, whether expressed or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose, which are specifically excluded. In no event shall Affineur be responsible to Consignor for any consequential, incidental or special damages, including loss of profits, resulting from Consignor's storage of its product in Affineur's Cheese Caves.

8. **Affineur's Right to Reject.** Affineur reserves the right to reject any delivery of product made by Consignor to Affineur's Cheese Caves if the product does not meet the quality specifications identified in **Exhibit B** attached hereto. Affineur shall notify Consignor of any rejection of product within ___ days after receipt of shipment. Consignor shall then immediately arrange for the removal of said product from Affineur's Cheese Caves and will be responsible for the following charges:

- Rental charges equal to _____.
- Processing fee of \$_____ to cover Affineur's time involved.

9. **Tracking of Product.** The parties herein agree that Affineur has no responsibility to track and/or identify the various batches of product Consignor delivers to Affineur's Cheese Caves. It is Consignor's sole responsibility to label, identify or in some other way brand its various batches of product delivered to Affineur's Cheese Caves in order to properly track which batches that Consignor seeks to remove from Affineur's Cheese Caves. If no identification or labeling has been indicated on the product delivered in a shipment, all product of Consignor shall be treated as one batch.

10. **Insurance.**

A. Consignor. Consignor shall be solely responsible for carrying a Commercial General Liability Policy and any and all business interruption insurance or product loss insurance to cover loss of all its product located in Affineur's Cheese Cave. Affineur shall not be liable for any damage to or loss incurred by Consignor. Furthermore, Affineur shall not be liable for any injury or damage to persons or property resulting from said third parties' consumption and/or contact with Consignor's cheese products stored in Affineur's Cheese Caves.

B. Affineur. Affineur shall, at Affineur's expense, obtain and keep in force at all times during the term of this Agreement, a casualty insurance policy covering the improvements to Affineur's Cheese Caves against loss or damage by fire and extended coverage hazards.

11. **Indemnification.** Consignor agrees to indemnify Affineur, and to save Affineur harmless, from and against any and all claims, losses, actions, damages, liabilities and expenses in connection with loss of life, personal injury and/or damage to property arising from or out of any consumption of, or contact with, Cosignor's cheese products being stored in Affineur's Cheese Caves under this Agreement. In case Affineur shall, without fault on its part, be made a party to any litigation commenced by or against Consignor, then Consignor shall protect and hold Affineur harmless and shall pay all costs, expenses and reasonable attorneys fees incurred or paid by Affineur in connection with such claim or litigation.

12. **Affineur's Responsibilities.** In consideration of the amounts to be paid to Affineur as provided for in Paragraph 2, Affineur agrees to undertake the following actions:

- (i) Weigh all product shipments upon their delivery to Affineur.
- (ii) Receive and unpack all product deliveries.
- (iii) Turn and/or rotate all cheeses in accordance with standard affinage practices.
- (iv.) Keep aging facility in accordance with WI DATCP licensing standards.
- (v.) Agree to keep Consignor's product identity private.

13. **Consignor's Responsibilities.** In consideration of the terms and conditions herein, Consignor agrees to undertake the following actions:

- (i) Provide proper notice to Affineur of all deliveries and pickups as otherwise set forth herein.
- (ii) To properly pay any and all invoices in accordance with the terms thereof.
- (iii) Brand and/or label any and all products for its own tracking purposes.
- (iv) Box and ship any and all product to Affineur's Cheese Caves.
- (v) Deliver only product that meets the specifications set forth in the attached **Exhibit B.**

14. **Default.** In the event of any failure of Consignor to pay any rental or other charges due hereunder within five (5) days after the same shall be due, or any failure to perform any other of the terms, conditions or covenants of this Agreement to be observed or performed by Consignor for more than five (5) days after written notice of such default shall have been mailed to Consignor, then Consignor shall be deemed to be in default under this Agreement. If said default remains in effect for a period of 30 days, Affineur shall have the right to proceed in selling Consignor's product as is set forth in section 5 of this Agreement.

In any event of default, in addition to any other rights herein stated, Affineur shall be entitled to recover from Consignor its cost, expenses and actual attorneys fees incurred in exercising Affineur's rights hereunder.

Affineur shall not be deemed to be in default with respect to any of the terms, covenants or conditions of this Agreement unless Consignor shall first give to Affineur five days written notice of such default, and Affineur failed to cure the default within ten days thereafter. Provided, however, if the default cannot reasonably be cured within ten days, then Affineur shall be deemed to have complied with such notice so long as it has commenced to comply with the notice within the period set forth in the notice and thereafter is proceeding to cure the default with all possible diligence.

15. **Notices.** All notices hereunder shall be in writing and shall be deemed to have been given only if delivered personally or mailed by registered or certified mail, postage prepaid, addressed as respectfully indicated or to such other addresses that shall be indicated by notice hereunder:

To Affineur: _____

To Consignor: _____

Notices given by mail in accordance with these provisions shall be deemed served and received when mailed. Either party may, from time to time, change such address by notifying the other party at least ten (10) days prior to the effective date of such change.

17. **No Partnership.** Affineur does not in any way become a partner, joint venture or member of a joint enterprise with Consignor.

18. **Miscellaneous.**

- A. Binding Affect. This Agreement shall be binding upon and be enforceable against the parties and their successors, legal representatives and assigns, and shall be effective upon delivery.
- B. Governing Law and Venue. This Agreement and the rights and obligations of the parties shall be governed by and construed in accordance with the laws and decisions of the State of Wisconsin. The exclusive forum for any lawsuit or legal action arising in whole or in part out of this Agreement shall be in the Circuit Court of _____ County, Wisconsin.

- C. Expenses and Fees. Consignor shall pay and reimburse Affineur for all costs, expenses and actual attorneys fees which are incurred and expended by Affineur in enforcing the covenants and terms of this Agreement.
- D. Waiver. The waiver by Affineur or Consignor of the breach of any term or covenant herein shall be limited to this specific instance and shall not be deemed a waiver of the term or covenant. No term or covenant of this Agreement shall be waived by Affineur or Consignor, unless the waiver is in writing.
- E. Entire Agreement. This Agreement represents the entire Agreement between the parties and supercedes all prior negotiations, representations or agreements between them, either written or oral. The parties are not relying on any statements or promises other than what is said in this Agreement.
- F. Counterparts and Facsimile. This Agreement may be executed by facsimile, which shall be treated as the original, and in counterparts, which, taken together, shall constitute the whole of the Agreement as between the parties.
- G. Opportunity to Consult with Counsel. The parties acknowledge that they have had a reasonable opportunity to consult with counsel concerning this Agreement.

IN WITNESS WHEREOF, this Agreement has been signed and delivered as of the date first above written.

Affineur

Consignor