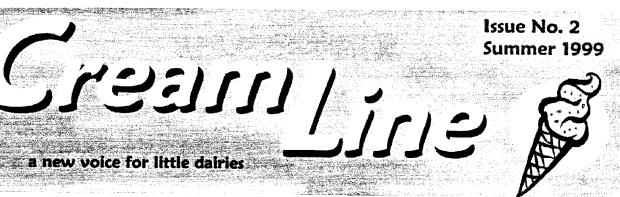
SI-RE Project No: 2597-083

S441 . S8552



Ice Cream for Fun and Profit

Not long ago, after having read the tale of a small-scale yogurt maker who composts his cream so he can make low-fat yogurt, I rushed off to the kitchen to make a batch of ice cream from the jar of unhomogenized Jersey milk in the fridge. What a tragedy. (Not the ice cream, the waste!) I suppose cream makes good compost, but it also makes great butter and ice cream.

Last spring I invested in a Krups countertop ice cream freezer (La Glacière), which cost about \$70, and have already used it far more than I ever used our old hand-crank freezer. Face it, when you have to go out and buy crushed ice and rock salt (we live four miles from the closest store), and you don't have a gang of kids hanging around, the romance of the hand-cranker fades fast. With La Glacière you just keep the removable bowl in your freezer and take it out when your ice cream mix is ready. In 15-20 minutes you have about a quart of ice cream. Since we tend to buy a lot of premium ice cream, I'd say the machine has nearly paid for itself already. The product is usually excellent as long as we use fine-quality ingredients. With Gail Damerow's book and *Ben & Jerry's Homemade Ice Cream and Dessert Book* (see Book Reviews), you can come up with some pretty good stuff at home.

Suppose you are a dairy farmer, you've been practicing making ice cream with your own milk, and want to make ice cream for sale. What do you have to consider?

Scale: Be sure to read at least one book about Ben & Jerry's – Ben & Jerry's: The Inside Scoop (most entertaining) or Ben & Jerry's Double-Dip – before you make any plans. You will think twice about going big-time, especially if you are over 20. The realities of the ice cream world are not pretty – there is only so much freezer space in this world. On the other hand, if you want to make an excellent product for a local market, you might just have a chance, if the other factors are in your favor.

V Location: Probably the most profitable way to sell ice cream is from your own store, by the scoop or pint. But for this to work well you must have a location where there are plenty of folks who get a sudden urge for a cone. People might drive an hour out of town for good cheese, but the maximum distance they'll drive for a scoop of ice cream is probably considerably less. If you are near a resort or tourist area, so much the better. Doesn't everyone eat ice cream on vacation?

Ice cream can be an excellent drawing card for other dairy product sales, too. Bergey's Dairy in Chesapeake, VA, for example, offers a full line of dairy products, as well as *Continued on page 3*

In This Issue:

The Editor's Page

Forum p. 2

This is Retirement?

Our Family Farms of Western Mass.p. 5

Cheesemakers-Lp. 5

Chef's Cornerp. 6

Ice Cream Recipes

Goat Milk Ice Cream

Book Reviews

Do Weeds Make Good Feeds?p. 10

Classifiedsp. 15



In order to have space for the Forum question, I'll keep my comments short this time. How quickly sixteen pages filled up!

Charley got his cow, a registered Canadienne (a rare breed, sometimes known as the Black Jersey) named "Docile," who is supposed to calve in late June. I think she's a little mis-named, since she does a lot of romping around for someone so pregnant, but evidently she *will* take on other cows' calves. In her honor,

I bought a used cappuccino machine on an 'e-bay' auction, and look forward to bGH-free cappuccinos!

While attempting to buy a cow this year we learned that "every hippie in the country" is looking for a milk cow in preparation for Y2K (according to a local farmer). That wasn't our reason, but we *are* taking Y2K seriously enough to buy a hand pump for the well, to grow a big garden, to start emptying out the freezer, and to stock up on some necessities. Everyone's tired of hearing about Y2K, but if you have been making preparations for your dairy farm and have suggestions to share with others, please write or email about them. A few weeks without electricity or supplies could be disastrous for a dairy farm. *Vicki Dunaway*



This space is for readers the share questions and answers recipes, whatever. Your questions may very well be the impetus for articles in future issues, so don't be shy. Write or e-mail to the addresses on page two in the CreamLine information column.

Question: In farmstead processing operations, different flavors in the milk are more pronounced than when milk from many farms is blended. Most folks are aware of the need to keep animals out of the wild onions (unless you are making onion cheese) and turnips before milking, but what might your animals eat to improve the flavor of the milk (and thus its products)? In *Keeping One Cow*, a 1906 book that contains essays written by people who have done just that, the one article written by a woman contains the following provocative statement:

"I might go on and tell you how when at first the cow got loose and wandered to the garden, I discovered that the taste of the butter was disagreeably affected by her eating certain herbs, and how it was very pleasantly flavored by others, how I am cultivating those herbs to make the sweetest and most golden butter; how — but dear me! for a one-cow story it is already too long."

Had she only been given the chance to continue! Have you had experience with forage plants or other feeds affecting the flavor of your milk? Are you experimenting with this at all? Please let us all know. *CreamLine* is published four times a year by Vicki Dunaway, for the Hometown Creamery Revival Project.

Phone: (540) 789-7877 (before 9 p.m. Eastern time)

Fax: same, call first

E-mail: ladybug@swva.net

Startup funding for *CreamLine* is provided by the Hometown Creamery Revival project, Southern Sustainable Agriculture Research and Education (SARE) grant #LS97-83.

Subscriptions to *CreamLine* are \$22 a year, \$40 for two years, and can be purchased by sending a check or money order to:

CreamLine P.O. Box 186 Willis, VA 24380

Please include your name, address and phone number or e-mail address when ordering a subscription.

All information provided in this newsletter is believed to be accurate. However, readers assume all responsibility for actions based on the information herein. Unless otherwise noted, all articles were written by the editor. Most material may be reprinted; please contact us for permission and give appropriate credit to the author and this publication. *CreamLine* is printed on recycled paper.

See page 15 for information on classifed ads.

Check out our web site at: www.vvac.org/creamery/ After mid-June it will be moved to www.metalab.unc.edu/creamery

Moving our site will allow us to make our own updates, which -- I promise -- will be more frequent.

Ice Cream! -- continued from page 1

Amish-made food items and gifts. Their store has benefited from suburban encroachment – in fact, Bergey's is able to sell all of their own milk and buys milk from others in order to satisfy demand. Many of their regular customers stopped the first time just to get an ice cream cone. Bergey's still runs a milk delivery route and has added several branch stores in the surrounding suburbs. They have had opportunities to expand, especially after the development of rbGH, but chose to stay small and local, giving others a chance to do the same.

If you don't have your own store, it might be possible to sell ice cream to delis or sandwich shops where lots of tourists stop. Of course, at that point you lose the advantage of scoop sales, but you may be able to sell a lot of ice cream if it's a good product. There is also the possibility of just producing an ice cream mix for a shop that wants to make its own flavors.

Selling ice cream in a tourist/resort area also has another plus – the tourist season (unless it's a ski resort) coincides with periods of naturally high milk production. It gives the dairy farmer the option of seasonal dairying, with a welcome break for cows and farmers.

Quality: Ice cream has to be good to keep people coming back. Get a reputation for good ice cream in a resort area and you can afford to close down for the winter and take a rest. It's impossible to compete in price with the companies that make ice cream that is half air, so why bother? Creamy ice cream with lots of top-quality ingredients is expensive, but people are willing to make that kind of investment when they treat themselves. After all, it's only a few bucks at most -- an "affordable luxury." Even people who complain about a gallon of milk costing too much will routinely pay over a dollar per scoop for good ice cream.

Ice cream cannot be kept for very long periods of time without loss of quality. It can be kept for about two months at 0° F., but longer-term storage requires temperatures of around -20°. (See under 'freezers' below.) High-fat, premium ice cream tends to keep better than types with lower fat content, another reason to go for the gold.

As with anything, learning to make good ice cream is a matter of practice. Consider an intensive short course, such as those offered by Pennsylvania State or University of Guelph in Ontario. These courses are expensive, about \$700-1000 for tuition (note the Guelph course costs \$995, but that is in Canadian dollars, which currently translates to about \$680 in US dollars). However, that is a reasonable investment for someone learning a new business. These courses are both lecture and hands-on, and no doubt reveal many "tricks of the trade" that will solve or prevent quality problems. For example, ingredients have to be added to ice cream according to the analysis of the milk in order to get a consistent product. It's not just a matter of making a larger batch of what you made at the family reunion last summer. According to their former CEO, Fred "Chico" Lager, Ben and Jerry learned to make ice cream from the Arbuckle book (see book reviews).

Organic ice cream might have a good following, but even if you use certified organic milk, finding all certified organic ingredients could be next to impossible. Even if you could find them, the premiums you would pay and the increased cost of transporting these ingredients would likely be prohibitive. Better opt for an all-natural product with no artificial ingredients. And for heaven's sake, forget milk produced using rbGH. No matter what the salesman says, consumers just don't want milk from those pumped-up cows. For some odd reason they don't trust what the FDA and USDA say about this hormone. People will pay extra for milk and milk products from healthy, grazed cows that are not maintained on routine antibiotics and hormones. Once you go for the mass market who doesn't care, you will find that they don't care about the quality of ice cream, either; they just want low price and large quantity, and you'll be competing for freezer space with the giants in the field.

Goat milk ice cream is an additional possibility, but may be too strange for most customers. It would be difficult to build a business on goat milk ice cream alone, except perhaps in certain ethnic communities.

Containers: The most common types of ice cream containers in use are the waxed cardboard type and plastic tubs. Choice of some equipment may depend upon the size of containers you want to sell, so make the container decision first. Of course, pints bring a higher percontainer profit than large bulk tubs, but what you can sell and where you sell it depends on your particular market. If all the ice cream is to be sold as hand-dipped, or hand-packed into smaller containers, bulk tubs will be the containers of choice. If you are aiming for freezer space next to Ben & Jerry, you'll need pints. There are <u>Continued on page 13</u>

So This is Retirement?

by Donna J. Betts

"You want to do **what**? But we're retired!!!" These were the words of chagrin profoundly uttered by my husband John when I announced that I wanted to go back into production agriculture after an eight-year hiatus to act as principal caregiver for a relative who lived more than an hour away. I was ready to change course.

We were married over sixteen years ago and both had off-farm employment. John had four children and I had eight. We have thirty-four grandchildren and three great-grandchildren, and are 70 and 66 years old respectively. He had purchased a fifth-wheel camper and truck that he named "Gwampa's Twuck," so you can guess what he had planned for retirement.

So what would possess anyone to want to go back into active farming status? Well, I say it's all his fault (what else would you expect from a woman?). Prior to this announcement John had been fulfilling his dream of travel-retirement by taking me to conferences on grass farming, eco-agriculture and sustainable agriculture all over the eastern U.S. That was the only way he could get me to travel – with a purpose. After three years of this the gnawing finally overtook me and the announcement came that "I can't stand going to any more of these conferences." "But I thought you liked them," he ventured. My response: "I either have to quit going, or do something about it. It seems like the perfect retirement for a farmer."

Every older farmer knows the feeling of seeing his/her farm being overcome by multiflora rose and brush while the fences fade into oblivion. Once the outer perimeter fences were in place, those inner fences would be a snap for me to move for rotational/management intensive grazing for at least the next twenty years, and I'd only be 84 – nuttin' to it! He still disagrees.

John's lack of project enthusiasm is an understatement, but he has been more than a real good sport in this effort. He had been in sheep all his life, and I had never been near one. We started with his choice of 12 Perendale ewes, a ram and nothing but portable web-net fencing. We were off and running three years ago this spring. Of course we started clearing for exterior fencing and building portable chicken coops for some laying hens at the same time.

The best way to describe us is Jack Lemmon and Walter Matthau, both in speed and personality. Some say it's a circus to watch. With persistence, time and this resource of occasional help from family and Soil Conservation, we have uncovered and fenced in about 40 acres of meadow/pasture, and developed a gravity-feed spring to all points on the back forty. The flock has had 10 ewe lambs added to motherhood each year, and we have 34 ewes lambing this spring. We winter pasture them along with the two miniature guard donkeys, Tom and Jerry.

For years John kept teasing me about my needing a herd of milk goats. He really was being facetious, and I didn't take it seriously. But to be serious about multiflora rose eradication the animal for the job is the goat. It started out just that way. Then last spring my son and daughter-in-law, at age 40, found they were pregnant with their first child. Jubilant though they were, some early pregnancy problems required her to quit 'bumping around' with their milk goats, at the OB's insistence. Plans were to milk after weaning the kids, so guess who volunteered to help out? It wasn't long before the question was, "what do you do with four gallons of goat milk every day?" It was the first time I had learned to do something strictly by reading a book.

It worked, though, and soon I was making about 80 pounds of cheese a week, and by summer's end seven different varieties were among the offerings at the farmers' market each Saturday. Naturally that illegal stuff, which was prepared in the same kitchen that prepared hundreds of pounds of food for the fire department's public meals, could not be offered for sale. The idea of offering it labeled as "pet food" just didn't sound too appealing. The option was

Dairy Project News -- "Our Family Farms of Western Massachusetts"

A group of dairy farmers from Massachusetts received some funding from several sources – USDA, the Farm Bureau and a sustainable agriculture group - to begin a dairy action group to help small farmers who were on the verge of going out of business because of the low wholesale milk prices they were receiving. A group of six farms milking a total of about 230 cows launched a new local milk brand (the title of their session at the 1998 Pennsylvania Association for Sustainable Agriculture was "Got Local Milk?) in September 1997 and have experienced excellent success. Their milk is picked up by a milk hauler and taken to a small processing plant, where it is kept in a separate silo from other milk. Then it is put into attractive, colorful cartons with the brand name "Our Family Farms of Western Massachusetts." Each half-gallon container features information on one of the farms (collect all six!) and describes the need for local foods and the promise of no rbST. The press took great interest in this project and consumer acceptance has been excellent despite a slightly higher price than competitors' milk. In fact, the big companies in the area dropped their prices a week after "Our Family Farms" milk went on the market. Bad idea. It made for a "big boys versus small" story that only helped the family farm producers. (Ben & Jerry's experienced a similar boost when Pillsbury tried to run them off the freezer shelves.) For marketing, the farmers take turns setting up a table in grocery stores and other public places with the help of a "milk marketing kit" they put together, which contains bumper stickers, coasters and other items with their logo, as well as cups for samples. The processor pays only the farmgate price that other dairy farmers receive, so in order to give the farmers a higher return, they are paid for their marketing time and receive dividends from sales. Returns of milk (spoilage) have only been about 2% on average, which is very low. The group expects to expand production and sales and perhaps to eventually build their own processing plant.

"Our Family Farms" bumper sticker



Cheesemakers-L

If you haven't already found "Cheesemakers-L" discussion group on the Internet, you are in for a treat. Host Julia Farmer, a cheesemaker from West Virginia, has gathered hundreds of like-minded folks from around the world into one cyberplace to discuss the details of making cheese and other products, as well as milk quality, animal problems, etc. Most members seem to be amateurs making goat cheese, but some of the discussions have been fairly advanced and very informative. Sometimes the posts get a little overwhelming, and some members haven't learned to send their chatty comments to specific people, but overall, Cheesemakers-L is a good place to get your questions answered. To subscribe, send an e-mail message to requests@hutman.com and type "Subscribe Cheesemakers-L" in the message body. If you don't have time to read all the e-mail, you can also visit the Cheesemakers' Web site and search their archives: http://members.xoom.com/cheesemaker/Cheesemakers-L.htm (You actually have to go to the 'subscribe' page to get to the archives. The page for archived recipes gives recipes only, not the conversations.) There are also several excellent links from this site. If you have a cheese-related Web page, you might want to link up.

Here's a pertinent post from Cheesemakers-L:

Speaking of ricotta, does anyone use this old Italian recipe? 1 gallon goat's milk and 1 qt. buttermilk. Bring up to 180° over medium heat, keep it at that temperature for 30 minutes for a dessert style, soft ricotta. Hold it there for 45 minutes for a chewier, cottage cheese style ricotta. There is a wonderful golden brown caramelized layer in the bottom of the pan when you are finished. We fight over the "scorched" part! (Kathy Coe, 4/30/99)

Chef's NCTS with COPPER Kelly Shepherd



I love ricotta. It's fresh, creamy and rich. It is also quite versatile, and can be used in sweet or savory preparations. Last fall we were presented with a "goodie bag" from my husband's Italian grandma from New Jersey. She lives in Englewood, near Jerry's Deli. In this paper bag was manna from Heaven. There was prosciutto, the salty, paper-thin ham of Parma; oil-cured olives; a beautiful sheep's-milk cheese studded with peppercorns; and a hunk of Sardo, a Romano-type ewe's milk cheese from Sardinia. But the jewel in the crown was the fresh ricotta, still in its pierced mold, homemade at Jerry's. Without a cow in sight they do this - I don't know how! But it doesn't matter. One taste will tell you that it is fresh, that this is how ricotta should taste. Good ricotta is so creamy and rich you are instantly hooked. Imagine it made from your own milk!

I had to act fast, as it must be used up quickly. There are so many things to do with it; it's hard to decide. I ended up making several hundred tortellini filled with ricotta, prosciutto and Swiss chard. Most were frozen in bags for later use, to be boiled at a moment's notice and served with butter and cheese. A really nice dinner in a hurry! I also made ricotta cookies. These are moist and only slightly sweet, with lemon rind. And the cheesecake is to die for.

Ricotta is usually made from whey, and is the by-product of the manufacture of other cheeses such as provolone. Different versions of ricotta are made all over Europe. There is Ziger from the Alps, French Recuit, and Corsican Broccio. The Corsican variety is made from goat's or ewe's milk whey boiled with whole milk. Broccio has the flavor of the wild herbs and heathers that the animals graze on.

Try the following cheesecake recipe with the best ricotta you can find (or make), then close your eyes and imagine that you are in Corsica.

Fiadone (Corsican-style Cheesecake)

4¹/₂ cups ricotta 8 eggs $2\frac{1}{2}$ cups sugar zest of two large lemons, finely minced butter for pan



from Saveur magazine, April 1999

Strain ricotta through cheesecloth or a fine sieve for one hour to remove excess moisture. Preheat oven to 350° F. Butter an 8" square baking pan. Line the bottom with buttered parchment paper and set aside. Whisk together the strained ricotta, eggs, sugar and rind in bowl. Pour into prepared pan. Bake until brown on top and toothpick inserted in center comes out clean, about an hour and 15 minutes. Allow to cool for 30 minutes. Run a knife around sides of pan, turn out onto a large plate, peel off paper, then turn cake face up. Serves 8.

Kelly Shepherd (pictured here with partner Drew Buzik) is coowner of The Invisible Chef, an in-home food service alternative in southwest Virginia. Kelly and her partners turn topquality foods into gourmet meals for busy people. They do the shopping, cooking and cleaning; the client just comes home, warms up the meal and delights in The Invisible Chef's outstanding cuisine. Kelly has agreed to write this column for CreamLine on a regular basis.



Chocolate Cappuccino Gelato*

This intensely chocolate-coffee gelato is so chewy it's a bit like frozen fudge. If you wish to harden it before serving, mold it in a loaf pan and serve it in slices. Garnish with mandarin oranges and a bit of orange liqueur, or top with whipped cream and warmed orange marmalade.

In heavy saucepan, heat	2½ c. milk
Stir in until dissolved	¾ c. sugar
Beat thick	3 egg yolks

Stir into milk mixture. Over low heat, stir until mixture coats a metal spoon, about ten minutes.

Stir in	3 oz. nonsweetened chocolate
	¹ / ₄ c. nonsweetened cocoa
	2 T. instant espresso

Strain and add 2 t. grated orange rind

Beat until cool. Chill and stir freeze. Yield: about one quart.

(Editor's note: The instant espresso was very hard for me to find in the rural area where I live, but eventually a high-end grocery store in a nearby college town ordered some for me. The source Ms. Damerow gives in the appendix will ship it, but they have a high minimum order. In a pinch, very strong liquid espresso or coffee will work, but the instant espresso makes a richer product. Orange rind is optional.)

French Vanilla Ice Cream*

The creamy richness of this ice cream is influenced by the number of egg yolks you use and the proportion of milk to cream. For super rich ice cream, include up to six egg yolks and use heavy cream in place of all the milk and cream.

Heat	1 c. milk ½ c. sugar
Beat thick	4 egg yolks
	mixture. Continue stirrin coats a metal spoon, abo

Stir into milk mixture. Continue stirring over low heat until mixture coats a metal spoon, about ten minutes. Cool.

Add	$1\frac{1}{2}$ c. cream	4
	2 t. vanilla	7

Chill and stir freeze. Yield: about one quart

(Editor's note: I've found that this recipe doesn't really yield a quart, so I usually increase the ingredients by half. In both of the above recipes, I "proof" the eggs/yolks by adding a bit of the hot milk mixture to them first, stirring, and then adding the eggs to the rest of the milk mix. I use this French vanilla as a base for flavored ice creams.)

*From *Ice Cream! The Whole Scoop*, by Gail Damerow. With permission of Glenbridge Publishing Ltd., 6010 W. Jewell Ave., Lakewood, CO 80232. 1-800-986-4135.

Ben & Jerry's Butter Pecan**

Salt is sometimes considered an optional ingredient, but for Butter Pecan Ice Cream, it is a key ingredient. The slightly salty taste is essential to the success of the flavor.

¹ / ₂ cup (one stick) butter	³ / ₄ cup sugar
1 cup pecan halves	2 cups heavy cream
¹ / ₂ tsp. salt	1 cup milk
2 large eggs	

- 1. Melt the butter in a heavy skillet over a low heat. Add the pecans and salt and sauté, stirring constantly, until the pecans start to turn brown. Drain the butter into a small bowl and transfer the pecans to another bowl and let cool.
- 2. Whisk the eggs in a mixing bowl until light and fluffy, 1 to 2 minutes. Whisk in the sugar, a little at a time, then continue whisking until completely blended, about 1 minute more. Pour in the cream and milk and whisk to blend. Add the melted butter and blend.
- 3. Transfer the mixture to an ice cream maker and freeze following the manufacturer's instructions.
- 4. After the ice cream stiffens (about 2 minutes before it is done), add the pecans, then continue freezing until the ice cream is ready.

Makes generous one quart.

**Excerpted from BEN & JERRY'S HOMEMADE ICE CREAM COOKBOOK, Copyright © 1987 by Ben Cohen, Jerry Greenfield, and Nancy Stephens. Used by permission of Workman Publishing Co., Inc., New York. All Rights Reserved. For information on individual and retail sales please call 1-800-722-7202.

CreamLine, Summer 1999

Goat Milk Ice Cream

The following two goat's milk recipes were sent by Barb Hansford, for those who like the taste of honey or prefer not to use sugar. They were adapted from recipes originally sent to Cheesemakers-L by Maryetta Ables, Barb points out.

Honey Vanilla Ice Cream

1/3 cup plus 1 tbsp. honey½ tsp. vanilla3 cups thin goat's milkfew grains salt

Heat milk, honey and salt to the scalding point over hot water. Remove and cool, add vanilla and freeze.

Honey Milk Sherbet

cup plus 2 Tbsp honey
 quart goat's milk
 Tbsp lemon juice
 fresh-squeezed, not reconstituted
 '/2 cup orange juice
 we use orange juice concentrate

Mix the fruit juices and honey. Stir until completely dissolved. Slowly add this to milk. If the milk should curdle, the curds will disappear in freezing.

Vanilla Ice Cream

(from Goats Produce Too!: The Udder Real Thing by Mary Jane Toth)*

2 c. goat milk
2 c. goat cream
1 c. sugar
1 tsp. vanilla extract (pure is best)

Combine all ingredients in ice cream canister. Stir thoroughly to dissolve the sugar. Freeze as directed.

*This book is available from the author at 2833 N. Lewis Road, Coleman, MI 48618. Phone: (517) 465-1982. Send check or money order for \$12.95 plus \$2 shipping and handling. The recipe is reprinted with the kind permission of the author. If you don't have an ice cream maker but drink a lot of coffee, try:

Coffee Can Ice Cream

This is an ice cream recipe that I found some time ago. It is great for kids and the elderly to do. It really does work!!

1 cup cream 1 cup goat milk ½ cup sugar 34 tsp. vanilla

Combine all ingredients in a clean one-pound coffee can. Place the lid on the can and secure with tape. Put the can inside a three-pound coffee can and pack with crushed ice between cans. Pour $\frac{3}{4}$ cup rock salt over the ice. Put on lid and seal with tape if necessary. Roll cans back and forth on the floor for about 10 minutes. Remove the lids, stir ingredients inside the inner can. Reseal with tape. Add new ice and salt as needed. Continue to roll for 5 -7 minutes. Makes 3 cups. Add strawberries or blueberries when stirring the icy mixture. I have made this and found it works best if the empty cans are kept in the freezer for about 8 hours.

Cindy Sarginson Sweetbrier Ridge Dairy Goats Jemseg New Brunswick Canada



CreamLine, Summer 1999

Book Reviews

Ben & Jerry's: The Inside Scoop, by Fred "Chico" Lager. 1994, New York: Crown Publishing. \$12.95 pbk. Available through most bookstores or from Ben & Jerry's web site at www.benjerry.com

"Chico" Lager was a former CEO of the now (in)famous Ben & Jerry's ice cream company. He tells the story of the company from its humble beginnings until he left in 1994 [?] The story is told with wit and style; he admits that everything may not be EXACTLY true, but the minor details he changes for drama only add to the reader's enjoyment. Ben Cohen becomes a truly larger-than-life figure, and through Chico's eyes one sees that it is Ben and his unswerving faith and beliefs that made Ben & Jerry's a success, despite challenges from just about everyone else. This book is recommended to anyone interested in beginning a business in this day and age.

Ben & Jerry's Double-Dip: Lead with your Values and Make Money, Too by Ben Cohen and Jerry Greenfield. 1997, New York: Simon & Schuster. \$24.00 hdbk. Available through most bookstores or from Ben & Jerry's web site at www.benjerry.com (great web site).

Ben and Jerry wrote this book to describe and promote "values-led business," with the hope that other companies will follow their lead and begin to do business from the heart. Maybe it was because I had already read Chico Lager's account of the story and knew the plot, but Double Dip seemed terribly long and redundant. The same ideas are hashed out over and over, the same dozen companies pointed to as great examples of values-led businesses, the same people offer their testimony throughout the book; it all could have been said in half the pages. The text is almost preachy in places and generally lacks the promised humor. Cute little conversations between Ben and Jerry are thrown in occasionally in bold type, but these add little or nothing to the whole. Ben and Jerry do make great ice cream. They do run a decent company. But maybe the Peter Principle is at work here. The book might be of interest to someone just learning about "leading with your values," and it does contain new information on activities following Lager's departure. But The Inside Scoop is much more fun and informative as it details the victories and pitfalls of a growing business.

Ben & Jerry's Homemade Ice Cream & Dessert Book, by Ben Cohen and Jerry Greenfield, with Nancy J. Stevens. 1987, New York: Workman Publishing. Available from the publisher (see recipes section) or by special order through most bookstores or from Ben & Jerry's web site at www.benjerry.com. \$8.95.

Yes, Ben & Jerry are giving away their recipes (maybe). This colorful, delightful little book contains recipes for making all the B&J favorites, plus baked goodies and toppings. They begin with the story of their company and then include a chapter on "Ice Cream Theory," which describes the roles of ingredients in ice cream. Although it's difficult to get Ben & Jerry's quality from a home ice cream maker (especially to find good fresh cream!), I made some outstanding butter pecan and good French vanilla (I like Gail Damerow's vanilla better – see below). If you have more than a passing interest in ice cream, buy this book.

Ice Cream! – The Whole Scoop, by Gail Damerow. 1995, Lakewood, CO: Glenridge Publishing Co. Available from the publisher (see recipes section) or by special order through most bookstores. \$17.95.

When Gail Damerow does a book you can count on it being thorough and well-done. Ice Cream! is no excep-Here you can find recipes for ice cream, gelato, tion. frozen custard, sherbet, ice milk, toppings, all manner of ice cream creations, ice cream for restricted diets and even dairy alternatives. It's clear she has done a lot of experimenting; Gail says she eats ice cream almost daily - but maintains a weight of around 120 pounds. She describes the different types of machines available for ice cream making, including small-scale industrial ones. There is plenty of information on ingredients and trouble-shooting and, while this book is not as detailed as the Marshall/ Arbuckle book, neither is it anywhere near as expensive. The recipes I've tried from this book have all been good to excellent. Highly recommended for the ice cream connoisseur.

Continued on page 15

Normally there will only be one book review per issue, but since all these books were listed as resources, I thought I'd go ahead and include them all. They are part of our annotated dairy bibliography which will be published this summer. -- Vicki

Do Weeds Make Good Feeds?

Farmers' market has been open for two weeks now. In our mountainous area of Virginia we are guaranteed maybe three months without frost (though one year we lost our melon crop to a June 14 frost, and my husband has seen frost here in August); this makes for a skimpy selection coming from the garden in mid-May. Most of the hardier stuff has come and gone, and the summer veggies are still under row cover. To make our market display look a bit fuller, my husband bags up tender lambsquarters (the greens, not the meat) as "wild spinach." We also put chickweed and young dandelion leaves in our "wild and domestic spring greens" mix. The city folks are hungry for wild things. Most probably don't know that lambsquarters are growing in the flower bed and chickweed in the lawn.

Lambsquarters – and chickweed and dandelion and plantain – are good food, even according to scientific studies on use of these plants as forages. With the rising interest in management-intensive grazing, I've seen some farmers become absolutely obsessive about weeds in their pastures. I had been operating on anecdote and gut feeling that some weeds are good feed until, at a conference, I had the pleasure of hearing R. L. Dalrymple of the Samuel Roberts Noble Foundation in Oklahoma. During his presentation he made a passing remark about the nutritive value of weeds, and after the session I cornered him to ask for more information. After he got home, Mr. Dalrymple remembered to copy several articles for me – SCIENTIFIC PROOF! from respectable publications such as *Agronomy Journal* and *Crop Science*. I feel validated.

If you think about it, almost all (dare we say all?) our pasture plants were once weeds, as were our human food plants. Until recently, humans (and animals) have simply "improved" by selection, nudging evolution a bit in the direction we want it to go. (Gene transfers are a whole different ball game, but let's not get into that!) Often, though, there is a trade-off-uniform, packable tomatoes have no flavor. In our improvement of pasture plants for, say, rapid growth in response to fertilizers, they have likely lost other qualities - mineral concentrations or pest resistnace, perhaps. Even now we humans cannot agree on what a weed is. In Stockman Grass Farmer there are advertisements for crabgrass and even (horrors!) quackgrass seed. [I hope for his sake that I never meet up with the man who sowed quackgrass seed on our farm.]

If we want to really go out on a limb, we could speculate what might happen if animals munched on small amounts of valerian. Might they be a little calmer? Might the antiseptic properties of rosemary and thyme in the diet make a dent in the multi-million dollar mastitis industry? We'll have to wait a few years for validation on those themes.

One general conclusion in all the studies that Mr. Dalrymple sent me is: for best results, weed species need to be consumed in a vegetative stage, not too mature. Since this is also true of most cultivated pasture plants, you might say it falls in the realm of "common sense" for the grazier. You goat and sheep and Highland cattle folks already know that your animals can thrive on less than pure alfalfa, but it may surprise you to see the numbers.

In Table 1 I have extracted some of the data gathered by researchers on the nutritive value of weeds. Table 2 is a copy of some values that might be of particular interest to owners of browsing animals. Please be aware that these are from different studies using different methods in different places, but the overall results may be useful in deciding whether to head out to pasture with the Roundup can.

Footnotes for Table 1 (page 11)

*Dalrymple, R.L., Bret Flatt and Julie Barrick. "Chemical Analysis of Some Common Forbs and Weedy Grasses," The Samuel Roberts Noble Formedation, P.O. Box 2180, Ardmore, OK 73402. Average values used.

**Marten, G.C., C. C. Sheaffer and D.L. Wyse. "Forage Nutritive Value and Palatability of Perennial Weeds," *Agronomy Journal*, vol. 79, no. 6. Average values for 1982 trials used here (more data available than for other two years of study).

***Marten, G.C. and R. N. Andersen. "Forage Nutritive Value and Palatability of 12 Common Annual Weeds," *Crop Science*, vol. 15, Nov/Dec 1975, pp. 821-827. Mean values used.

****Bosworth, S.C., C. S. Hoveland, G. A. Buchanan, and W. B. Anthony. "Forage Quality of Selected Warm-Season Weed Species," *Agronomy Journal*, vol. 72, Nov/Dec 1980. Mean values for vegetative state used.

CreamLine, Summer 1999

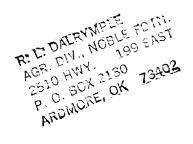
Cattle trials	% Crude						
Dairymple et al.*	Protein	%P	%K	%Ca	% Mg		Palatability
Barnyard grass	11.00	0.34	0.02	0.28	0.18		good
Little barley	6.80	0.06	0.66	0.24	0.19	1.1.14	good-poor
Shepherd's purse	18.59	0.28	1.34	1.06	0.32		fair-good
Prickly lettuce	20.88	0.32	2.96	1.04	0.35		good-exc.
Horsenettle	22.87	0.30	2.07	0.93	0.37		poor-fair
Milkweed	19.90	0.29	2.20	0.72	0.27		poor
Oxalis	19.38	0.29	2.05	0.64	0.35		good
Curly dock	19.22	0.28	2.78	0.63	0.42		fair-good
Smartweed	18.50	0.23	4.00	0.54	0.38	na an a	good
Pigweed	19.50	0.21	2.07	1.23	0.35		good
Lamb trials	g/kg ⁻¹	g/kg ⁻¹	g/kg ⁻¹	g/kg ⁻¹	g/kg ⁻¹	g/kg ⁻¹	
Marten et al.**	СР	<u>P</u>	K	Ca	Mg	DMD	Palatability
Alfalfa [©]	222	3.4	27.0	14.7	3.4	716	excellent
Sm. bromegrass	180	3.7	32.9	3.5	1.8	702	good
Quackgrass	215	3.8	33.3	4.3	2.0	690	good
Dandelion	178	4.4	46.7	11.8	4.2	760	good
White campion	184	5.2	54.4	7.9	5.7	738	good young
Peren. sowthistle		4.8	47.9	17.3	7.5	460	poor
Jerus. artichoke	233	4.5	41.6	15.2	5.5	778	poor
Canada thistle	215	3.6	33.1	25.4	4.9	764	poor
Curly dock	219	3.9	41.2	9.2	5.3	635	poor
					terte i jos		
Sheep trials	% Crude					%	
		A / B		- · •			
Marten et al.***	Protein	<u>%P</u>	<u>%K</u>	%Ca	%Mg	DMD	Palatability
Yellow foxtail	22	0.4	5.8	0.4	0.6	74	good
Yellow foxtail Barnyardgrass	22 22	0.4 0.4	5.8 3.7	0.4 0.7	0.6 0.7	74 79	good good
Yellow foxtail Barnyardgrass Green foxtail	22 22 21	0.4 0.4 0.3	5.8 3.7 4.6	0.4 0.7 0.5	0.6 0.7 0.6	74 79 75	good good good
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed	22 22 21 21 24	0.4 0.4 0.3 0.5	5.8 3.7 4.6 5.5	0.4 0.7 0.5 2.7	0.6 0.7 0.6 1.6	74 79 75 7 9	good good good good
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed	22 22 21 24 23	0.4 0.4 0.3 0.5 0.4	5.8 3.7 4.6 5.5 3.1	0.4 0.7 0.5 2.7 1.6	0.6 0.7 0.6 1.6 1.7	74 79 75 79 62	good good good good good
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters	22 22 21 24 23 26	0.4 0.4 0.3 0.5 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7	0.4 0.7 0.5 2.7 1.6 2.7	0.6 0.7 0.6 1.6 1.7 1.5	74 79 75 79 62 71	good good good good good good
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed	22 22 21 24 23 26 26	0.4 0.4 0.3 0.5 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9	0.4 0.7 0.5 2.7 1.6 2.7 2.6	0.6 0.7 0.6 1.6 1.7 1.5 0.8	74 79 75 79 62 71 80	good good good good good
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard	22 22 21 24 23 26 26 26 20	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5	74 79 75 79 62 71 80 69	good good good good good good poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur	22 22 21 24 23 26 26 20 20 24	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.3	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0	74 79 75 79 62 71 80 69 77	good good good good good good good poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard	22 22 21 24 23 26 26 26 20	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5	74 79 75 79 62 71 80 69	good good good good good good poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®]	22 22 21 24 23 26 26 26 20 24 19	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.3	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0	74 79 75 79 62 71 80 69 77 71	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp.	22 22 21 24 23 26 26 26 20 24 19 % Crude	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.3 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3	74 79 75 79 62 71 80 69 77 71	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.****	22 22 21 24 23 26 26 26 20 24 19 % Crude Protein	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.3 0.4 %P	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3	74 79 75 79 62 71 80 69 77 71 71	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.****	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.3 0.4 %P 0.13	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.9	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 % Mg 0.35	74 79 75 79 62 71 80 69 71 80 69 77 71 8 MD 84	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.3 0.4 %P 0.13 0.33	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 % Mg 0.35 0.34	74 79 75 79 62 71 80 69 77 71 % DMD 84 70	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 % Mg 0.35 0.34 0.35	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.4 %P 0.13 0.33 0.15 0.16	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1 3.3	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 % Mg 0.35 0.34 0.35 0.30	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1 3.3 2.4	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 0.3 0.3 0.35 0.34 0.35 0.30 0.31	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80 74	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed Redroot pigweed	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9 23.9	0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 % K 2.6 3.7 3.1 3.3 2.4 3.7	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02 1.47 1.32	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 0.3 0.3 0.35 0.34 0.35 0.30 0.31 0.71	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80 74 73	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed Redroot pigweed Fall panicum	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9 23.9 19.0	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.4 %P 0.13 0.33 0.15 0.16 0.16 0.55 0.36	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 % K 2.6 3.7 3.1 3.3 2.4 3.7 3.5	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02 	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 0.35 0.34 0.35 0.30 0.31 0.71 0.31	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80 74 73 72	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed Redroot pigweed Fall panicum Yellow foxtail	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9 23.9 19.0 17.5	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1 3.3 2.4 3.7 3.5 5.0	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02 	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 0.3 0.3 0.35 0.34 0.35 0.30 0.31 0.71 0.31 0.22	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80 74 73 72 73	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed Redroot pigweed Fall panicum Yellow foxtail Crabgrass	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9 23.9 19.0 17.5 14.3	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.3 0.4 %P 0.13 0.33 0.15 0.16 0.16 0.55 0.36 0.31 0.43	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1 3.3 2.4 3.7 3.5 5.0 4.0	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02 1.47 1.32 0.33 0.38 0.42	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 1.0 0.3 0.3 0.35 0.34 0.35 0.30 0.31 0.71 0.31 0.22 0.35	74 79 75 79 62 71 80 69 77 71 % DMD 84 70 82 80 74 73 72 73 79	good good good good good good poor poor poor
Yellow foxtail Barnyardgrass Green foxtail Redroot pigweed Pa. smartweed Lambsquarters Common ragweed Wild mustard Cocklebur Oats [®] Warm-season spp. Bosworth et al.**** Sicklepod Hemp sesbania Tall morning-glory Ivy morning-glory Fla. beggarweed Redroot pigweed Fall panicum Yellow foxtail	22 22 21 24 23 26 26 20 24 19 % Crude Protein 21.6 31.2 20.1 19.3 21.9 23.9 19.0 17.5	0.4 0.4 0.3 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4	5.8 3.7 4.6 5.5 3.1 5.7 3.9 1.8 3.8 2.9 %K 2.6 3.7 3.1 3.3 2.4 3.7 3.5 5.0	0.4 0.7 0.5 2.7 1.6 2.7 2.6 2.3 2.7 0.4 %Ca 1.12 1.02 	0.6 0.7 0.6 1.6 1.7 1.5 0.8 0.5 1.0 0.3 0.3 0.3 0.35 0.34 0.35 0.30 0.31 0.71 0.31 0.22	74 79 75 79 62 71 80 69 77 71 71 % DMD 84 70 82 80 74 73 72 73	good good good good good good poor poor poor

Table 1. ANALYSIS OF SOME COMMON FORBS AND WEEDY GRASSES

@Cultivated species for comparison.

*See p. 10 for footnotes. CP = Crude Protein DMD = Digestible Dry Matter (in vitro)

Table 2



COMPOSITION OF SELECTED PLANTS FOUND IN SOUTHERN WOODLANDS

The values shown below were obtained from plant communities of counties in southwestern Alabama. The laboratory work was done by Auburn University and the samples were taken by Extension and SDA/SCS/RCD personnel from representative Woodlands within a region where Angora goat production had been introduced by Langston University, 1988-90.

Alfalfa pasture, all analyses 24 19.4 58 Fesue, all analyses 24 11.1 62 Bernuda grass, common 27 8.8 54 Bahia 28 9.4 55 Poke Salad 15 25.3 86 Pigweed 19 22.1 80 Greenbriar 29 12.2 63 Dogwood 35 8.1 75 Willow Oak 42 9.0 67 Water Oak, July 48 11.8 66 Water Oak, Sept 47 8.7 63 Sumac, Sept 19 14.4 73 Sumac, July 42 9.0 83 Ragweed 22 17.4 71 Privet Hedge, July 37 16.4 74 Privet Hedge, Sept. 28 12.4 65 Kudzu, July 19 19.2 58 Kudzu, July 19 12.7 61 Loblolly Pine, July 41 6.8 72 Blackberry Vines, Sept. <td< th=""><th>FEEDSTUFF</th><th>% DRY MATTER</th><th>% C PROTEIN</th><th>% TDN</th></td<>	FEEDSTUFF	% DRY MATTER	% C PROTEIN	% TDN
Fesue, all analyses2411.162Bermuda grass, common278.854Bahia289.455Poke Salad1525.386Pigweed1922.180Greenbriar2912.263Dogwood358.175Willow Oak429.067Water Oak, July4811.866Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Blackberry Vines, July458.672Blackberry Vines, July4310.569Wax Myrtle, July3011.080Sweetgum, July3011.080Sweetgum, Nept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Chirson Clover1817.765Lespedza, early2518.758<	Alfalfa pasture, all analyses	24	19.4	58
Bermuda grass, common 27 8.8 54 Bahia 28 9.4 55 Poke Salad 15 25.3 86 Pigweed 19 22.1 80 Greenbriar 29 12.2 63 Dogwood 35 8.1 75 Willow Oak 42 9.0 67 Water Oak, July 48 11.8 66 Water Oak, Sept 47 8.7 63 Winte Oak 45 11.9 61 Sumac, Sept 19 14.4 73 Sumac, July 42 9.0 63 Ragweed 22 17.4 71 Privet Hedge, July 37 16.4 74 Privet Hedge, July 19 19.2 58 Kudzu, July 19 19.2 58 Kudzu, Sept. 19 21.7 61 Loblolly Pine, July 41 6.8 72 Clover, Osceola 34 16.9 63 Blackberry, Vines, Sept. 46 9.0<		24	11.1	62
Bahia 28 9.4 55 Poke Salad 15 25.3 86 Pigweed 19 22.1 80 Greenbriar 29 12.2 63 Dogwood 35 8.1 75 Willow Oak 42 9.0 67 Water Oak, July 48 11.8 66 Water Oak, Sept 47 8.7 63 White Oak 45 11.9 61 Sumac, Sept 19 14.4 73 Sumac, July 42 9.0 83 Ragweed 22 17.4 71 Privet Hedge, Sept. 28 12.4 65 Kudzu, July 19 19.2 58 Kudzu, July 19 21.7 61 Loblolly Pine, July 41 6.8 72 Clover, Osceola 34 16.9 63 Blackberry, Vines, Sept. 44 8.2 73 Wax Myrtle, Sept. 46 9.0 70 Willow 33 10.5 6		27	8.8	54
Pigweed1922.180Greenbriar2912.263Dogwood358.175Willow Oak429.067Water Oak, July4811.866Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.063Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, July3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum, Sept.319.482Broom Sedge7513.767Plum4313.986Cheroke Rose3512.884Crimson Clover1817.765Lespedza, aarly2518.758Lespedza, mid3116.456	-	28	9.4	55
Greenbriar2912.263Dogwood358.175Willow Oak429.067Water Oak, July4811.866Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Oscoola3416.963Blackberry Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456 </td <td>Poke Salad</td> <td>15</td> <td>25.3</td> <td>86</td>	Poke Salad	15	25.3	86
Greenbriar 29 12.2 63 Dogwood 35 8.1 75 Willow Oak 42 9.0 67 Water Oak, July 48 11.8 66 Water Oak, Sept 47 8.7 63 White Oak 45 11.9 61 Sumac, Sept 19 14.4 73 Sumac, July 42 9.0 83 Ragweed 22 17.4 71 Privet Hedge, July 37 16.4 74 Privet Hedge, Sept. 28 12.4 65 Kudzu, July 19 19.2 58 Kudzu, Sept. 19 21.7 61 Lobiolly Pine, July 41 6.8 72 Clover, Osceola 34 16.9 63 Blackberry Vines, Sept. 44 8.2 73 Wax Myrtle, July 43 10.5 69 Wax Myrtle, Sept. 46 9.0 70 Willow 33 13.9 75 Honeysuckle, late 37	Pigweed	19	22.1	80
Willow Oak429.067Water Oak, July4811.866Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	2	29	12.2	63
Willow Oak429.067Water Oak, July4811.866Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		35	8.1	75
Water Oak, Sept 47 8.7 63 White Oak 45 11.9 61 Sumac, Sept 19 14.4 73 Sumac, July 42 9.0 83 Ragweed 22 17.4 71 Privet Hedge, July 37 16.4 74 Privet Hedge, Sept. 28 12.4 65 Kudzu, July 19 19.2 58 Kudzu, Sept. 19 21.7 61 Loblolly Pine, July 41 6.8 72 Clover, Osceola 34 16.9 63 Blackberry Vines, Sept. 44 8.2 73 Wax Myrtle, July 43 10.5 69 Wax Myrtle, Sept. 46 9.0 70 Willow 33 13.9 75 Honeysuckle, late 37 7.4 62 Sweetgum, July 30 11.0 81 Sweetgum, Sept. 36 14.9 80 Sweetgum, Sept. 31 9.4 82 Broom Sedge	-	42	9.0	67
Water Oak, Sept478.763White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		48	11.8	66
White Oak4511.961Sumac, Sept1914.473Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	—	47	8.7	63
Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum, Sept.319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		45	11.9	61
Sumac, July429.083Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Sumac, Sept	19	14.4	73
Ragweed2217.471Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum, Sept.3513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	-	42	9.0	83
Privet Hedge, July3716.474Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	·	22	17.4	71
Privet Hedge, Sept.2812.465Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	-	37	16.4	74
Kudzu, July1919.258Kudzu, Sept.1921.761Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		28	12.4	65
Loblolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Kudzu, July	19	19.2	58
Lobiolly Pine, July416.872Clover, Osceola3416.963Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Kudzu, Sept.	19	21.7	61
Blackberry Vines, July458.672Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		41	6.8	72
Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Clover, Osceola	34	16.9	63
Blackberry, Vines, Sept.448.273Wax Myrtle, July4310.569Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Blackberry Vines, July	. 45	8.6	72
Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		44	8.2	73
Wax Myrtle, Sept.469.070Willow3313.975Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Wax Myrtle, July	43	10.5	69
Honeysuckle, late377.462Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456		46	9.0	70
Sweetgum, July3011.081Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Willow	33	13.9	75
Sweetgum, Sept.3614.980Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Honeysuckle, late	37	7.4	62
Sweetgum Twigs319.482Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Sweetgum, July	30	11.0	81
Broom Sedge775.954Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Sweetgum, Sept.	36	14.9	80
Sycamore2513.767Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Sweetgum Twigs	31	9.4	82
Plum4313.986Cherokee Rose3512.884Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Broom Sedge	77	5.9	54
Cherokee Rose 35 12.8 84 Crimson Clover 18 17.7 65 Lespedza, early 25 18.7 58 Lespedza, mid 31 16.4 56	Sycamore	25	13.7	67
Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Plum	43	13.9	86
Crimson Clover1817.765Lespedza, early2518.758Lespedza, mid3116.456	Cherokee Rose	35	12.8	84
Lespedza, early2518.758Lespedza, mid3116.456	Crimson Clover	18		65
Lespedza, mid 31 16.4 56	Lespedza, early	25		
	Lespedza, mid			
	Lespedza, late	.37		

Ice Cream! -- continued from page 3

several sizes in between, but again, these are in the domain of Pet, Sealtest & company, and most likely you won't get a foothold there. Figure what \$3 to \$4 a pint adds up to in terms of a gallon.

🕈 Equipment

Pasteurizer: If you are already processing milk in any form other than aged cheese, you probably have a pasteurizer. If not, you will need one to make ice cream for sale. The entire ice cream mix (excluding flavorings) has to be pasteurized. Pasteurizers are available new or used and vary in price according to size.

Measuring or metering equipment: Depending on scale, this can involve a wide range of equipment needed to measure mix ingredients and flavorings, including both wet and dry measures.

Production freezers (ice cream makers): Not long after getting my Krups machine, I found a used countertop batch freezer, the Simac II Gelataio, via the Internet. Since at that time I thought I might be making ice cream for a new sandwich shop, I purchased the machine. My opinion was that the difference between it and La Glacière was not worth the difference in cost, at least as far as the quality of ice cream produced. New, the Simac machine costs about \$500 plus shipping. The biggest difference is that you can make consecutive batches with the Simac and similar internally-cooled machines, while you have to re-freeze the bowl for the Krups. Since I didn't have a lot of space and the sandwich shop didn't materialize, I proceeded to sell the Simac and am still very happy with my Krups machine. For a larger scale, however, you need the ability to make more than a quart every twelve hours. Check out the following Web site for a look at the different machines available, including small-scale commercial ones.

http://www.essetti.com/applncs/icecream.htm

Gail Damerow also discusses the various types of freezers in her book, *Ice Cream!: The Whole Scoop.* Even for a commercial batch machine that will make lots of ice cream, the price is pretty reasonable (for dairy equipment), about \$4000. Important is to get one that will not whip too much air into the milk – called "overrun" – which reduces the density and makes the ice cream fluffy rather than smooth and creamy. (For some reason they always have that tasteless, fluffy ice cream at dairy field days and farm tours. Not very good advertising, in my opinion.) Overrun is the percent increase in volume while freezing. "Economy" ice cream may have 90-100% overrun, while superpremium (gourmet) ice cream has only 20-40%.

For the largest operations, a continuous freezer is the ice cream maker of choice. These allow precise control and newer ones are programmable; continuous freezers would likely be out of the price range of most farmstead ice cream makers.

Fillers and Cappers: On a small scale, ice cream containers can be filled and capped by hand from the processing freezer, but larger operations will require filling, capping and labeling machines.

Novelty machines: Those cute little ice cream bars in animal shapes, ice cream sandwiches or nutty-buddy type novelties all require special equipment – molds, extruders, dippers, freezing tunnels, etc. Unless you are working on a very small scale, forget it till your business is much bigger.

Storage Freezers: Of course, ice cream has to be frozen and stay that way. Hardening, which is done right after the ice cream comes out of the ice cream maker, should be done as quickly as possible, preferably at a temperature of less than 0° F (-18° C). There are many factors that affect the amount of time it takes to harden ice cream, including fat content, overrun and container size, but it should never take over six hours. After hardening, the ice cream can be stored at a higher temperature, below 32° F, if it is not to be stored for a long time. Thus, energy (and money) savings can be achieved by having two freezers, a smaller one for hardening and a larger one for storage. In areas prone to power outages, an appropriately sized backup generator is a must. Ice cream should not be stored for very long periods (over two months), as the structure tends break down and ice crystals form, so it is imperative to have a market in place and be able to rotate stock out of the freezers quickly. You must also consider the amount of time the ice cream will remain in the retail setting.

Transportation: If ice cream is to be delivered long distances, at least one special freezer truck will be needed. Small amounts can be transported using dry ice, but the cost is probably prohibitive to be used on a regular basis.

Ice Cream! -- continued from page 13

Facilities: As with any other form of dairy or food processing, your building must comply with your state's health regulations, including washable interior surfaces and isolation from any part of the dairy where animals hang out. See the section on regulations for more detail.

In addition to the actual processing room, you will need dry, rodent-proof storage space for ingredients, containers, and other necessities. Some of the ingredients will need to be refrigerated. You will also need appropriate freezers, most likely walk-in freezers, which will require special electrical wiring. Depending on the scale of your operation, and whether you intend to buy milk from others, you may need a loading dock and intake area. If you are planning to have a retail area at your farm, space will have to be allotted for that, and consideration made as to whether there will be seating space available. A public rest room is also important.

Regulations: Anyone in the dairy business is familiar with regulation. Dairy foods are some of the most highly regulated foods, thanks to past experience with sinister diseases such as brucellosis and tuberculosis. Today the concern is more about *Listeria, Salmonella,* and *E. coli.* With dairy cattle being raised in confinement, spending their lives in a mixture of mud and manure, there is little hope of relaxation of regulations. Small-scale operators whose animals live on pasture and whose facilities and milk are very clean have a long way to go to convince regulators and consumers otherwise.

Many states have adopted Federal guidelines on dairy products, and so the regulations are similar in these states. However, the interpretation of the written law and the flexibility (or lack thereof) of the regulating agencies can be bewildering. No matter what, it is important to have the regulating agencies inspect your premises and get their input before starting your new venture and during the building process. You are making a big investment, and you may as well do it by the book, rather than be closed down because of some error in your own interpretation of the rules.

Virginia's book of rules and regulations on ice cream and frozen desserts is pretty intimidating at first glance. But close inspection reveals that about 32 of the 46 pages of the booklet consists of definitions of the words in the rules and of the different products. And they don't even have a definition for *gelato*! The facilities and process regulations are fairy general and similar to those for any type of food production, with the addition of pasteurization as a requirement and bacteriological plate counts. Ice cream mix comes under the classification of "milk for manufacturing purposes," and requirements are not as stringent as for fluid milk products.

Regulations include labeling, and all those definitions will tell you how you can label your product. Milk fat and milk solids are a big factor in frozen dessert labeling. You will need nutrition labeling on each different product (flavor) you make, which involves a test of each product. A food service establishment will come under health department restaurant regulations, as well.

If you aren't totally discouraged after all this, and if your situation seems to be right for the ice cream business, gather more information, practice making ice cream, and let your friends and family tell you what they like. Of course, you must include vanilla and my favorite, chocolate chip.

Resources

Books (see p. 9 for reviews and availability)

Ice Cream Courses

Ice Cream Technology Course, University of Guelph, Ontario. December (may be every other year). Cost \$995 Canadian (~\$680 US). Contact Office of Open Learning, 159 Johnston Hall, University of Guelph, Guelph, ON N1G 2W1. Phone (519) 767-1114.

Pennsylvania State University, Ice Cream Short Course, January 4-13, 2000. \$915. For more information contact Robert Roberts, 8 Borland Laboratory, University Park, PA 16802, Phone: (814) 863-2959, Fax: (814) 863-6132; or visit the Web page:

http://www.cas.psu.edu/docs/CASCONF/ICECSC.HTML

Pennsylvania State University, Successful Ice Cream Retailing Seminar, January 14-17, 2000. Contact Ed Marks, P.O. Box 5387, Lancaster, PA 17606-5387, Phone: (717) 569-8286, Fax: (717) 569-8680, or:

http://www.cas.psu.edu/docs/CASCONF/ICERTL.HTML

Anyone know of others?

Book Reviews -- Continued from page 9

Ice Cream by Robert T. Marshall and W. S. Arbuckle (fifth edition). 1996, New York: Chapman & Hall. The fifth edition is available from *The Cheese Reporter*, 4210 E. Washington Ave., Madison, WI 53704. www.cheesereporter.com, \$74.95, hardcover.

This is the book that Ben and Jerry used to get started. What more needs to be said? It seems to be quite complete, including detailed information on everything you need to know about ice cream, including mix recipes, ingredients, costs, processes, nutrient values, quality, lab testing and much more. There is even information on the proper way to scoop! Highly recommended for those serious about ice cream as a product. The fourth edition of this book was written by W. S. Arbuckle only and published in 1986. Unfortunately it is no longer in print and the publisher is out of stock. I say unfortunately because the print is smaller in the fifth edition, making it harder to read for those of us over 40. Presumably all the same information is in the new book, plus some.

CLASSIFIEDS

FOR SALE: Sheep dairy equipment in Virginia. Everything you need for milking. Call Virginia or Jim at (540) 261-9647, or e-mail. jim@rockbridge.net.

WANTED: Milk can coolers in operating condition. Mid-Atlantic region preferred. Call Vicki at (540) 789-7877 or e-mail at ladybug@swva.net.

WANTED: Small bulk tanks (150 gallons or less). Mid-Atlantic region preferred. Call Vicki at (540) 789-7877 or e-mail at ladybug@swva.net.

Classifieds -- buy and sell equipment, books, animals, etc. Up to 25 words, \$5 per issue for subscribers; add \$5 for each 25 words thereafter. Non-subscribers add additional \$5 to total.

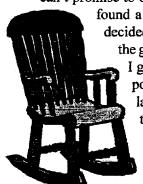
Display ads -- contact *CreamLine*. See page 2 for contact information.

Retirement? -- Continued from page 4

exercised to request a "suggested donation" per pound. (A somewhat risky practice -- ed.) We enjoyed the frozen overage last winter, and we sure do make a delicious lasagna using whole milk cottage cheese, from age blanc, ricotta and mozzarella, along with my homemade spaghetti sauce and home-canned beef. Yummy!

We are currently working with ACEnet (Appalachian Center for Economic Networks) and the community kitchen in Athens, OH toward getting a goat cheesemaking facility up and running within their approved facility. That will take another year to start up. For now I am milking from my current herd of 16 goats, milkers and browsers of multiflora rose to rehabilitate some of the more impassable areas on our down-overs and up-out-ofs, better known as hillsides.

We are slated to host a field day this summer with Innovative Farmers of Ohio. We will be studying our experimental frost-free seedings of a variety of seeds on our toxin-free pastures to see which work best for us. For the field day we can't promise to offer a rerun of an incident from last fall, even though it might add to the festivities. We



found a ewe that had picked up an 18-inch-long piece of antique barbed wire in her wool and decided it should be removed. A little grain and John's call got them close enough for John to grab the gal in question. "I've got her!" he yelled. Then -- "Grab her! grab her!" Leaping into action, I grabbed the ewe from behind just as she ran over Grandpa John, knocking all 6'5" and 250 pounds of him to the ground, with arms, legs and glasses flying every which way. I was still latched on to the ewe. As the dust settled, I was on the ground with my arms and legs cradling this ewe on top of me. In what seemed like ten minutes later, John untangled himself, got up, extricated the wire from the animal and announced, "you can let go of her now." The title of this story could be "Grandpa got run over by a ewe and Grandma," but that just doesn't have the same ring as "Grandma got run over by a reindeer."

Such is life on Gwamma's Farm. You're welcome to come sit a spell. We have a little-used rocking chair you can relax in.

Donna lives with her husband John, as well as the goats, sheep and other critters on Gwamma's Farm in Whipple, Ohio.

Coming up in CreamLine:

Fall issue feature -- Building a sheep dairy from "scratch," including milking parlor, milk room and processing room.

Preparing pastures for winter -- Ways to improve pastures for next year.

Book Review -- *Cheesemaking Practice*, new edition. (We had too many book reviews to include it this time.)

TA and pH -- What's the difference? Should you care?

Forum -- Ask and answer questions. Discuss controversial subjects.

Chef's Corner -- Kelly has more luscious dairy recipes.

Cheesemaking Courses to be Offered

Later this summer and this fall the Hometown Creamery Revival project will be offering cheesemaking courses at the Western North Carolina Nature Center in Asheville, NC. Instructors will be experienced (maybe even famous!) cheesemakers. CreamLine subscribers will be notified of registration information by mail. Others should send a postcard with name and address and/or e-mail address requesting to be notified.

We'd love to hear from you.

If you have a small dairy and are doing things that might be of interest to others, please write, call or e-mail (see page 2). Of special interest: on-farm processing, management intensive grazing ideas and experience, unique dairy management solutions, equipment you have modified. We'd also like humorous pieces, poetry, art work, tips, recipes and ideas. If we do a feature article about your farm, you will receive a year's subscription to *CreamLine*.

Ł

CreamLine P.O. Box 186 Willis, VA 24380