

The American Cheese Society

E W S L E T T E R

THE DOWN UNDER CHEESE SCENE

by: Avice R. Wilson



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ago.

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Among other principles the code contains a special section dealing with the manufacture of raw milk soft cheeses. Within the Codex an anomaly has developed since Australian law has forbidden the making of raw milk soft cheeses, yet they can be imported! ASCA has submitted an

application to Australia's National Food Authority to permit the use of raw milk in the making of specialty cheeses.

A decision has not yet been made, but the NFA accepted the application and called for public comment. By last November submissions opposing the application had been received from several national and state dairy boards in Australia and New Zealand. Support came from small cheesemakers and retailers. I was told by a government official that the application is being carefully considered from all possible angles and a decision is not expected quickly.



Illustration by: Zingerman's Service Network

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(If any of the above information is

incorrect or has changed, please contact Maurine at the ACS office.)

The American Cheese Society Newsletter is Published By:

Deborah Haws - Publisher
Regi Hise - Managing Editor
Dick Groves - Co Editor
Gerd Stern - Co Editor
Layout By: Richard Haws

LETTER FROM THE PRESIDENT

My Dear Friends and Cheese Lovers,

Spring is a time of re-awakening and change, and so, in the tradition of the Chinese, by whom my life has been so deeply touched, I am exercising my ten year option to change. Every ten years I try to reinvent myself, bursting from the chrysalis of my former life into the butterfly of the new. I am leaving Adronico's, my place of employment for ten years to pursue other goals. Among these others will be consulting as "Integrity Consulting™", and the formation of a new venture called The Living Traditions Collaborative™ to help preserve living traditional cultures and their arts before they disappear from the face of the earth,...and reading, which I have been so busy I haven't been able to do regularly for four years or more. I am becoming older, but not wiser as the saying goes.

The interest in the Metsovo Conference has been good, but not enough to be enough help to our cheesemakers. Twenty seven cheesemakers applied, twenty-two qualified, but we only had enough attendees to offer two matching grants. This deeply saddens me.

As an incentive I have offered all applicants the opportunity to come at our cost, and for every person who signs up at full

price mentioning them they get 100 dollars more off. (With the lower price, if they get four people to sign up its the same as the matching grant) Hopefully this will make it possible for some more who wish to come to be able to come. The ideal solution would be if more people would sign up who are not cheesemakers as this generates the money for the matching grants and makes this wonderful opportunity possible for those who want to come and need it most, our small farmhouse and specialty cheesemakers. To encourage you, your friends, or Chef's you know, or anyone else you know who wants an amazing trip to a beautiful place at a reasonable price which helps small cheesemakers thus helping the future of cheese in America, I am including the itinerary as it stands now. (see next page) Please, if you can't come, spread the word ASAP to friends and associates. We will honor the ACS price of \$1,900.00 all inclusive from New York or \$2,200.00 all inclusive from the West Coast, for all attendees. While the conference will be a success as is, I will be left with sadness if we can't help more cheesemakers who want to come, come.

Looking forward to Metsovo and the CIA!

Daniel Strongin

WORLD CHEESE CONTEST WINNERS

The 1996 World Championship Cheese Contest sponsored by the Wisconsin Cheese Makers Association judging was held March 5 -7, 1996 in Green Bay, WI Dekker's of Coberco Kass Wierden, Wierden Netherlands for Gouda was this years winner with a final round score of 99.10. The cheeses were judged by an international team of judges. The World Championship winner is the manufacturer with the highest scoring cheese in the second round of judging, which includes

the winners from the 19 Best of Class contest winners. First Runner-Up to World Champion was a Cheddar by Gilles Vallee, Agropur Notre-Dame-du-Bon, Conseil, Quebec Canada with a final score of 98.94. Second Runner-Up to World Champion was Niels Kyed, MD Foods Amba, Hoegelund Mejeri, Vogens, Denmark, with his Danish Blue (60% Cream) with a final round score of 98.83. There were a total of 787 entries from 23 states and 18 countries.

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THE FIRST INTERNATIONAL CONFERENCE ON FARMSTEAD AND SPECIALTY CHEESE METSOVO GREECE JUNE 14TH TO 19TH, 1996

inerary:

June 13: Departures from West Coast (SFO or LAX) -Olympic Airlines

June 13: Departures from East Coast (New York JFK) -Olympic Airlines

June 14: Arrive in Athens 1:45 pm; Connecting flight to Thessaloniki (Salonica) Bus transfer to Metsovo (approximately four hours) Metsovo Conference Center has arranged accommodations.

June 15: Recovery day and registration

June 16:
12:00 am BREAKFAST
First Group takes trip to top of mountain with Shepherds to make cheese the traditional way, in animal skins.

12:00 Conference begins
INTRODUCTORY REMARKS: Daniel Strongin, President of the American Cheese Society

1:15 THE FLOWERING OF BYZANTINE CULTURE, a brief history. Sotiris Kitrilakis

2:00:15 THE EDIBLE TREASURES OF GREECE by Elena Averof, Lidia Kitrilakis and others

a brief history of Metsovo and the Epirus region of Greece and its culinary treasures including Trahana, Yogurt, Bulgur, Sweet and Savory Pies, Rose Petal Jam, Walnut Sweets, Honey, Wine, Tsipouro, and Herbal Teas from the Mountainside, and especially, Cheese. Plus other regions and their regional specialties

3:15 BREAK

4:15:30 THE MAKING OF ARTISINAL BRINE AND FETA CHEESES at Cheese Factory

5:20:30 pm LUNCH

6:30 TRADITIONAL SOLUTIONS TO THE CHALLENGE OF WHEY

7:30 REGIONAL GREEK CUISINE FROM SWEET TO SAVORY - Lidia Kitrilakis and Elena Averof

a chance for some of us to work hands-on preparing and sampling regional Greek dishes featuring Cheese made by master cooks

OR

3:30 THE TRADITIONAL WAY OF MAKING YOGURT AND YOGURT CHEESE. A hands on demonstration led by Apostolis Bissas and the Shepherds.

5:00 SESSIONS END

6:30 DINNER

8:00 A COMPARATIVE CHEESE TASTING OF CHEESES brought by Attendees and Hosts.

Monday June 17:

7:00 am BREAKFAST

Round Table Discussions on various Topics including Strategies for The Long Term Survival of Small Farmhouse and Specialty Cheese: International Cheesemaking Exchange Projects: Ensuring a Quality Milk Supply: Action Plans for the Future: etc. Second Group leaves for Mountaintop to make cheese.

9:00 DEMONSTRATIONS OF RELATED REGIONAL CRAFTS AND PRODUCTS: *Wool and Weaving, Barrel Making and Wood Working, Dyeing.*

10:30 THE CHALLENGES OF PRESERVING FRENCH TRADITIONAL CHEESEMAKING IN THE ERA OF EEC AND GATT. Members of the Guildes des Fromageres.

11:30 THE WISE USE OF TRADITIONAL METHODS OF AGING, STORING AND PRESERVING CHEESE including smoking, aging, oil curing, drying, brining, aging in barrels, coating in ash and wax, and the modern methods of tinning, paraffin, wrapping paper and cryovac, Linda Hughes, Sotiris Kitrilakis and Apostolis Bissas.

1:00 pm LUNCH

3:00 WHEN BIG THINKS SMALL, OR A HANDFUL OF PEOPLE CAN MAKE A DIFFERENCE: (The Land of Lakes Balkan Project (tentative) Kristen Penn, Land of Lakes Balkan Project and Master Bulgarian, Albanian, and Romanian Cheesemakers.

The true story of how a small group of dedicated people has helped rebuild dairy farming and cheesemaking in Romania, Bulgaria, and Albania against incredible odds.

4:00 THE OLD AND THE NEW: NEW TECHNOLOGY TO ENHANCE AND PRESERVE OLD WORLD TRADITIONS, Lidia and Sotiris Kitrilakis
A presentation of cutting edge technologies at the service of Farmhouse and Specialty necessities.

5:00 THE TRIUMPH OF THE SMALL IN A MULTI-NATIONAL CORPORATE WORLD: A LOCAL AND INTERNATIONAL ACTION PLAN. Daniel Strongin
How small scale specialty cheesemakers have more in common with each other world wide than with the corporate commercial forces in their own countries. How the multi-national corporations have used communication and cooperation to overcome national boundaries and preserve their livelihood for decades and what we can learn from it to preserve our way of living.

5:30 SESSION ENDS

6:00 A FESTIVAL ON THE MOUNTAIN TOP: The People of Metsovo
To commemorate the return of the flocks from the Wintering Lowlands, a Shearing Feast with Food, Drink, Song and Dance on the Mountain Peak overlooking the Village.

June 18

EXCURSIONS TO THE XVTH CENTURY MONASTERY OF ST. NICHOLAS, *small local agricultural producers, the Byzantine City of Ioannina, home of silversmithing, copper and brass, glass works and shopping, and Ali Pashas Castle.*

*** Wednesday, June 19, 1996** Bus transfers from Metsovo in the early AM (4 am) for Departure from Thessaloniki to Athens (8 am), Athens to JFK departs (12:30 pm) Arrives JFK ?????????

* Returns are open ended; You may book your own departure date but return to the US must be from Athens.

Other Details

Breakfast, all meals and transfers are included.

HANDMADE SPECIALTY PRODUCTS

y: Dominique Delugeau



As you know, larger cheese manufacturers seem to shy away from producing non-consuming specialty products. But, smaller companies know that there is need and market for many out of the ordinary items. The forming of the American Cheese Society created an alliance for small specialty cheese companies and has provided recognition for producing handmade specialty cheeses. As a group have established a "niche market" and have created excitement within the specialty cheese industry with unique products. Specialty styles of Auricchio Provolone have been an integral part of our classic

line since the company's beginning in 1877. Handmade from a generations old family recipe, Auricchio Provolone is a real Italian tradition.

Our 2# Manteche is a hand formed Provolone that has a center of pure sweet, unsalted butter. Before refrigeration, Italians used this as a way to preserve butter for long periods. Eventually, the butter develops a flavor similar to the Provolone and can be used as a simple spread or as a unique tasting drawn butter for seafood or vegetables.

Auricchio 5# Caciocavallo Provolone is hand formed into a bowling pin shape and is hand tied for hanging. History says that the pin shape was first formed when the shepherds would carry hand tied balls of Provolone from their horse saddles. During long rides, the Provolone would form a pin shape by bouncing and rubbing against the side of the horse.

Two hundred pound salami shaped Provolones are also very unique and popular. We only produce these at a certain time each year and companies place their orders a year in advance. The hand forming process begins with a 200# ball of curd which is formed and stretched for 3 to 4 hours by a few cheesemakers. There is no machine that could handle the job.

Cheese shops create excitement in their stores by composing a sign up sheet for their customers promising them a slice of the 200 pounder. Most shops display the cheese in a prominent area and hand slice the declared pieces in front of each customer. This has become a holiday tradition for many families.

New Name For Famous Company

Denmark Wisconsin-- Auricchio Cheese has changed its name to BelGioioso (pronounced bel-joy-oso) Cheese, Inc. To explain the name change, one has to go back to 1979, when Errico Auricchio came to the United States and founded the company as a subsidiary of the family owned company in Italy. In 1992, Mr. Auricchio purchased the US company and the licensee to the exclusive use of the name Auricchio in the United States. "It seems more appropriate not to use a licensed name as part of our corporate name," says Mr. Auricchio, "But," adds Errico, "We did not change our quality. We have become famous for making high quality Italian cheeses and we intend to continue this tradition of excellence."

OWN UNDER.....continued

Judging from the ASCA newsletters, all cheesemakers have the same concerns in Australia as in the USA and Britain. There are articles on traditional cheesemaking, on brown pigmentation in mould ripened cheese, on the Listeria question, discussions on the handling and aging of specialist cheeses, the success of Australian winemakers and whether specialist cheesemakers can repeat that success. (Judging from the flavor of the cheeses I tasted they undoubtedly will.) Report given in the latest issue of a controversy concerning criticism of a cheese judge from Wisconsin who at last year's agricultural show at Sydney (Australia's most famous) had damned a shed Rind cheese *(similar to the ch Void cheese or our limburger) as

"off." Several person's in the cheese industry and media concluded that the judging at this show was antediluvian. This decision resulted in a specialist cheese show being organized six months later. It drew 97 entries. Washed Rind cheese and Goat cheese took first places, cheddar's and white moulds came last. Perhaps we can persuade Australian specialist cheesemakers to enter our competition this year.

In the next newsletter I will discuss many of the varieties of cheese made in Australia, their flavor and quality, and how they are distributed.

* French Reblochon, Irish Gubbeen

EDITORS NOTE

We would like to apologize for forgetting the information in the last issue on purchasing Avice Wilson's book "The Forgotten Harvest," reviewed by John Greeley.

Priced at (US)\$20.00 (includes postage and handling) Forgotten Harvest can be ordered from: Thatcher Distributing Group, 5 Cotter Drive, New Brunswick, NJ 08901-1506

Please include check or money order with your request.

TRIPPING WITH GERD

(THE INTREPID TRAVELER)

ON THE TRAIL OF GARRTOXA

by: Gerd Stern, March 24, 1996



When Steve Jenkins and I arrived in Barcelona we were ready to forage through Catalonia for artesanal cheeses for presentation two days later to the one hundred or so international journalists, food scientists, dietitians, restaurateurs and food mongers attending the Oldways Foundation sponsored first Barcelona Congress on the Mediterranean Diet. On our way out of the airport we looked through the window of the duty-free shop and admired an example of our prime objective, the local, somewhat aged, grayish rinded round of Garrtoxa (in Catalonia x is pronounced "ch"). If we had guessed how elusive this type would be we could have collected it first out. But Steve had written about these cheeses and we had a supposed appointment with the makers.

We discovered, after registering at our hotel, that the cheesemakers we had been appointed to see expected us yesterday and would not be available during our foraging trip. Just then we had a call from our Brindisa of London friend Monika Lavery and we arranged to meet her and her partner Scott Boden at Plaza de Pi's cafe and marketplace. There we found Jordi Camejero, engineer turned goat cheese maker, displaying fresh and matured cheeses from the milk of his Murciana goats. His Suao Clual delight-

ed the tastebuds and we bought a few examples of each for our tastings. The older rounds had intense grace notes, in that borderline rot-ripened range, but the acidity and ammoniation did not overcome the rich mouthfull of pleasure giving flavors. Jordi exclaimed that he made cheese his own way, neither following tradition nor technical know-how. Suao is the Catalunyan version of the Spanish word *saue* (gentle) and seems to be widely used in Spanish cheese nomenclature.

From this coincidental encounter we promenaded to Boqueria, an indoor market hullabaloo of fresh produce, seafood galore, meats, dairy and much of what else: a sensorial overload of culinary potential, but not much in the way of artesanal quesos.

Monika's past includes some years of teaching English in this region, so next morning she guided us down the "Diagonal" over the "Meridiano" to the town of Vic (pronounced 'beak') a provincial ciudad replete with central marketplace filled, on that Saturday, by carts and stands of clothing, jewelry, foodstuffs, live rabbits, pigeons, chicks, pheasant and peacock.

In the streets radiating from the plaza we found Xancuterias aplenty, up-market establishments featuring the indigenous meat and cheese specialties. the charcuterie selection was awesome, shape upon shape of sausage topped by aristocratic ranks of black hoofed jamon Serano. One of these choice hams complete with skin and bone, local production, was priced converted by us to US. \$350. Several of these shops featured farmstead cheese and we acquired about a dozen beauties including two sheep cheeses made by Ferran Riba at Riudarnes la Selva: one a fresh, fresh curd cheese, Mato' de Drap, a bit loose and with wonderful savor of what sheep milk is all about, the other a Recuits d'Armigon, ripened with an off-white crust resembling a meringue featuring smooth well-

knit paste and revealing subtle nuances of still developing taste sensation. Such finds were much appreciated by our assembled colleagues; I delivered myself of a poem on our research and Steve gave an authoritative, affectionate description of each cheese.

The congress schedule was packed with technically oriented sessions on a wide range of food topics from olive oil through ground nuts and accompanied by gustatory luncheons and dinners of the highest Catalanian styled cuisine and including a wine tour of the Freixenet Cava cellars and the Torres estate. In parallel with the Oldways events, there was the Alimentaria, Spain's principle food show, a twenty-hall international monster of a food show encompassing the entire edible cornucopia. For us the highlight was an exhibition of 100 artesanal cheeses, an opportunity to taste the utmost creations of Spain's queseras and queseros. For a charge one could taste all at will, with breads and wines to match. This display was assembled by Eric Canut and Mariano Paez Saez of Spain's Artesanal Cheese Association. We are negotiating to see if we can bring this grand collection to the US at some future opportunity.

On my way back I spent two days with our Neal's Yard friend in London. While there I received a fax from my office asking me to bring back 25 pounds of Irish Farmstead cheese for the White House's St. Patrick's Day dinner. I requested a fax from the chef to use when passing US Custom's and was informed that they did not want a "paper trail" regarding the purchase of non US origin products. I guess FDR's maxim, "nothing to fear but fear itself" is no longer operative in those precincts. The New York customs agent gave me an ironic "Sure, Sure" when I mentioned the destination, but followed it with "get the hell out of here" and the Clinton's had their Cashel Blue, Coolea and Gubbeen for "the wearing of the green."

We need new members. If you have any names and addresses to suggest, phon, fax, or write to ACS Membership chairperson:

**Gerd Stern, Galilee/Infood
P.O. Box 98
Tenafly, New Jersey 07670
Voice - 201-569-3175**


**Fax - 201-569-3073
Your Help is needed and will be appreciated.**

NUTRITIONAL VALUE OF DAIRY PRODUCTS OF EWES AND GOATS MILK - PART 1 OF 2

by: Dr. George Haenlein, University of Delaware, Newark-DE, USA

Proceedings, 2nd IDF Seminar on Production and Utilization of Ewes and Goats Milk, Limin - Hersomissos, Crete, Greece, Oct. 19 - 21, 1995

SUMMARY



The composition of ewes and goats milks varies over a wide range because of genetic differences between species, between breeds within species and within breeds. These genetic differences have considerable influences on the cheese making process and on human digestion of these milks. Furthermore, the stage of lactation, daily variation, season, parity, type of diet, physiological status, health of udder and processing procedures change the contents and levels of major and minor constituents in the milks and its products. This provides therefore considerable potential to tailor-make ewes and goats milks according to the needs and preferences of consumers, and to provide an alternative to cows milk, where this is economically or medically advantageous, but more research documentation is needed in this area.

INTRODUCTION

The aim of this paper is to focus on properties and attributes of the milk and dairy products from ewes and goats as they contribute to human nutrition. The composition of the milk of ewes and goats and factors affecting it has been viewed comprehensively (Parkash & Jenness, 1968; Jenness, 1980; Anifantakis, 1986; Juarez & Ramos, 1986). Further important contributions have been published by Anifantakis et al. (1980), Merin et al. (1988), Casoli et al. (1989) Voutsinas et al. (1990), Espie & Sullman (1990), Simos et al. (1991), Haenlein (1992), Peeters, et al. (1992), Turk (1992: 1994), Sakul & Boylan (1992), Agnihotri & Prasad (1993), Bindal & Wadhwa (1993), Quiles et al. (1994), Conner (1994), Kalantzopoulos (1994) among others. However, only a few deal with the relation to human nutritional needs, which has been pointed out by Parlet (1981) "...the variation of composition of milk has not received the attention it deserves, except by a few workers." This is still largely true today and a 1st World Congress of Dairy Products in Human Health and Nutrition gave ewes and goats milk no recognition and deserved coverage, when it was held in Spain in 1993 (Serrano Rios et al.,

1994).

Interest in the original properties of milk, as it comes from the farm, should be high, when it is consumed as fluid whole milk, partly skimmed or as yoghurt. Dairy products, mainly cheeses (except those made from whey) contain only the casein and fat fractions of milk, but no whey proteins, nor lactose and soluble minerals, so interest may be limited here to the original composition of casein and fat only, and changes during cheese fermentation. Ewes milk, depending on region and economic conditions, is mostly processed into cheese and yoghurt. Goats milk on the other hand, in some countries, is consumed as fluid milk, even on a commercial basis, besides being processed into dairy products. Therefore, the characteristics of all components of goats milk are of considerable market interest.

Interest in the nutritive value of ewes milk is concerned mostly with the yield and evaluation of its cheeses and yoghurt.

Interest in the nutritive value of goats milk includes all fractions and how they differ from those in the milk of other species. In order to sell goats and ewes milk and their products for human consumption, their needs and tastes, it is of considerable market advantage to know the factors that cause milk composition to vary and to what extent. This will be even more important in the future, when it becomes better known how to change original farm milk composition by manipulating e.g. the feeding of goats and ewes in order to tailor make milk to the needs of diet conscious and disease afflicted consumers and their children, and to satisfy consumers with higher income, who have developed a sophisticated connoisseur taste for goats and ewes milk products. Ewes and goats milk has considerable economic importance in some countries. The Mediterranean region produces 66% of the world's ewes milk (Table 1) and 18% of the world's goats

Table 1. The world's leading ewes milk countries
(> 100,000 t in 1993) (FAO, 1994)

	Ewes milk 1,000 t	Ewes milk in % of world ewes milk production	Ewes milk in % of all milk produced in country (1)
France*	1,100	14.2	4.1
Turkey*	1,050	13.5	10.2
Iran	810	10.4	21.8
Italy*	650	8.4	5.8
China	630	8.1	7.8
Greece*	620	8.0	34.9
Syria*	515	6.6	37.3
Sudan	505	6.5	14.1
Romania	390	5.0	11.7
Spain*	275	3.5	4.2
Algeria*	235	3.0	23.2
Afghanistan	200	2.6	37.0
Somalia	190	2.4	25.2
Iraq	175	2.2	33.0
Bulgaria*	138	1.8	8.7
Yugoslavia*	134	1.7	3.0
Mediterranean area*	5,107	65.8	11.7
World	7,766	100.0	1.5

(1) Includes all milk from cows, buffaloes, ewes and goats.

k (Table 2) (FOA, 1994). Of all milk produced by cows, buffaloes, ewes and goats combined, ewes milk makes up 1.5%, goats milk 2% of the world total, but in the Mediterranean region it is 11.7% and 3.3% respectively. In at least 7 countries, including Greece, ewes milk or goats milk is more than 20% of all milk produced; and in at least 10 countries the combined production of ewes and goats milk is more than 20% of all milk in that country (Table 3 and 4) (FOA, 1994). In some countries including Greece, there are more than 1 ewe and goat combined per person (Table 3) and at least half of the countries with leading ewe and goat populations have more than 1 ewe and goat combined per hectare permanent pasture and, again Greece included. The significance of ewes and goats milk in human nutrition in these countries varies widely (Table 4) from less than 5 kg milk per person per year to more than 50 kg, assuming that FOA statistics, which are very difficult to obtain in some countries, approximate the real conditions. The food supply for protein or calcium from animal sources, including milk and dairy products, also varies greatly between these countries (Table 4), and averages in many countries far below the minimum

daily requirements of 65 g protein and 800 mg calcium (NRC, 1968). This gives much support to contention that improved ewes and goats milk production is one of the best strategies to relieve human starvation, undernutrition and malnutrition and therefore has great market growth potential, incentive and justification, especially in areas where pasture conditions, climate, mountainous terrain and economic conditions favor small ruminants.

The market of ewes and goats milks and their products has essentially three aspects:

- 1) home consumption and self-sufficiency,
- 2) gourmet menus and natural foods preferences,
- 3) medical needs.

Knowledge of the nutritive values of ewes and goats milk, what causes them to be different or to change, and comparison with the cows and human milks will help each of these markets. Some evidence from recent research with the ewes and goats comprises this review.

FACTORS AFFECTING MILK COMPOSITION: GENETICS

Average genetic compositional differences between species, ewe versus goat versus cow, and compared to human milk are considerable (Posati & Orr, 1976) in absolute and relative terms (Table 5 and 6). Ewes milk is generally much higher in solids contents than goats, cows or human milks, but compositional categories and contents of individual minerals, fatty acids and amino acids vary in different directions between the species, and without relation to higher or lower solids contents. The high solids content of ewes milk makes it generally superior to goats or cow milk for processing into cheese and yoghurt, because of higher yield and firmer processing quality without additives. However, this must be balanced in economic terms against lactation milk yield and lactation length of milking ewes, which is much less and shorter than for goats and cows.

Table 2. The world's leading goats milk countries (> 100,000 t in 1993) (FAO, 1994)

	Goats milk 1,000 t	Goats milk in % of world ewes milk production	Goats milk in % of all milk produced in country (1)
China	2,200	21.6	3.5
Bangladesh	997	9.7	55.2
Iran	897	8.7	24.2
Pakistan	602	5.8	3.5
India	565	5.5	15.8
Greece*	460	4.5	25.9
Turkey*	430	4.2	6.6
France*	417	4.0	1.6
Malaysia	385	3.7	51.0
USSR	350	3.4	0.3
Turkey*	304	3.0	3.0
Indonesia	184	1.8	28.8
China	178	1.7	2.2
Italy	161	1.6	42.7
Italy*	155	1.5	1.4
Brazil	140	1.4	0.9
Mexico	136	1.3	1.8
Greece*	130	1.3	12.8
Mediterranean Area*	1,896	18.4	3.3
World	10,294	100	2.0

1) Includes all milk from cows, buffaloes, ewes and goats.

Table 3. The world's leading countries in milk producing ewes and goats combined populations (>100,000 t milk in 1993) (FAO, 1994)

	Ewes + goats mill.	People mill.	Ewes + goats per person	Pasture permanent mill. ha.	Ewes + goats per ha permanent pasture
China	208	1,206	0.2	400	0.5
India	163	896	0.2	11	14.8
USSR	140	290	0.5	324	0.4
Iran	69	63	1.1	44	1.6
Pakistan	68	128	0.5	5	13.6
Turkey*	49	60	0.8	12	4.1
Sudan	38	27	1.4	110	0.3
Brazil	32	157	0.2	187	0.2
Spain*	28	39	0.7	10	2.8
Bangladesh	27	122	0.2	<1	45.0
Algeria*	21	27	0.8	31	0.7
Somalia	18	10	1.8	43	0.4
Indonesia	18	195	0.1	12	1.5
Mexico	17	90	0.2	74	0.2
Syria*	17	14	1.2	8	2.1
Greece*	16	10	1.6	5	3.2
Afghanistan	16	20	0.8	30	0.5
Mali	14	10	1.4	30	0.5
Romania*	13	23	0.6	5	2.6
Italy*	11	58	0.2	5	2.2
France	11	58	0.2	11	1.0
Iraq	8	20	0.4	4	2.0
Yugoslavia*	7	24	0.3	6	1.2
Bulgaria*	6	9	0.7	2	3.0
Mediterranean Area*	179	322	0.6	95	1.9
World	1,703	5,572	0.3	3,424	0.5

Nevertheless, published average data of milk of different species have been used with caution, because within each species there are great genetic differences due to breeds and selected families, which can be used to market advantage.

Genetic differences in milk composition within species have a wide range for ewes milk fat from 4.6% to 12.6% (Casoli et al., 1989) and an average of 7.1%

(Anifantakis, 1986); for ewes milk protein from 4.8% to 7.2% and an average of 6.1%, depending on breed. Other components follow these ranges. It must be emphasized that cows milks, when ewes or goats milks are compared with them, also have a wide compositional range due to breeds; e.g. average Holstein milk fat, at 3.6% versus average Jersey milk fat at 4.2% and milk protein from 3.3% to 3.9%

(Anifantakis, 1986), besides other breeds. Goats milk composition likewise can have great differences, depending on breed, e.g. for milk fat from 2.3% to 6.9% (Juarez, 1986) and an average of 3.3%; for goats milk protein from 2.2% to 5.1% and an average of 3.4%. A major portion of this variation includes negative correlations between milk yield and composition, i.e. low yields have higher contents and vice versa.

Within species within breed one can identify through selective breeding considerable differences in milk composition. This includes genetic polymorphisms of milk proteins,

Table 4. The importance of ewes and goats milk to human nutrition in countries leading in their production (>100,000 tons in 1993) (FAO, 1991, 1994)

	Ewes + goats milk 1,000 tons	Ewes + goats milk in % of all milk in country (1)	All milk/ person/ year kg	Food Supply all animal products/ person/day	
				Protein g	Calcium mg
Albania	575	76.2	76	31	796
Australia*	1,080	60.8	178	57	683
Bangladesh	1,015	56.2	15	5	43
Brazil	245	46.2	26	-	-
Canada	1,707	46.0	59	-	-
Afghanistan	240	44.4	27	-	-
Argentina*	579	42.0	99	19	337
Indonesia	259	40.5	3	9	54
Algeria*	365	36.0	38	19	416
Australia	1,070	30.0	132	20	438
Bulgaria*	218	13.8	176	52	604
Turkey*	1,354	13.2	171	18	206
Romania*	434	13.0	145	43	522
Spain*	705	10.8	167	59	529
China	808	10.0	7	12	40
Italy*	805	7.2	194	57	604
France*	1,517	5.7	457	76	966
Pakistan	646	3.8	134	15	337
India	2,220	3.5	70	8	195
Yugoslavia*	134	3.0	185	40	511
Mexico	136	1.8	84	31	303
Brazil	140	0.9	101	24	297
USSR	350	0.3	349	56	567
Mediterranean area*	7,191	10.6	211	44	538
World	18,060	3.5	93	25	255

1) Includes all milk from cows, buffaloes, ewes and goats.

Table 5. Average composition of milk (100 g) of 4 species (Posati & Orr, 1976)

	Ewes	Goats	Cows	Human
Solids, total, %	19.30	12.97	12.01	12.50
Energy, kcal	108	69	61	70
kj	451	288	257	291
Protein, total, %	5.98	3.56	3.29	1.03
Lipids, total, %	7.00	4.14	3.34	4.38
Carbohydrates, %	5.36	4.45	4.66	6.89
Ash, %	0.96	0.82	0.72	0.20
Ca, mg	193	134	119	32
Fe, mg	0.10	0.05	0.05	0.03
Mg, mg	18	14	13	3
P, mg	158	111	93	14
K, mg	136	204	152	51
Na, mg	44	50	49	17
Zn, mg	-	0.30	0.38	0.17
Ascorbic acid, mg	4.16	1.29	0.94	5.00
Thiamin, mg	0.065	0.048	0.038	0.014
Riboflavin, mg	0.355	0.138	0.162	0.036
Niacin, mg	0.417	0.277	0.084	0.177
Pantothenic acid, mg	0.407	0.310	0.314	0.233
Vitamin B6, mg	-	0.046	0.042	0.011
Folic acid, mcg	-	1	5	5
Vitamin B12, mcg	0.711	0.065	0.357	0.045
Vitamin A, RE	42	56	31	64
IU	147	185	126	241
Saturated FA, g	4.60	2.67	2.08	2.01
C4:0, g	0.20	0.13	0.11	-
C6:0, g	0.14	0.09	0.06	-
C8:0, g	0.14	0.10	0.04	-
C10:0, g	0.40	0.26	0.08	0.06
C12:0, g	0.24	0.12	0.09	0.26
C14:0, g	0.66	0.32	0.34	0.32
MCT total (C6 - C14), g	1.58	0.89	0.61	0.64
C16:0, g	1.62	0.91	0.88	0.92
C18:0, g	0.90	0.44	0.40	0.29
Monounsatur. FA, g	1.72	1.11	0.96	1.66
C16:1, g	0.13	0.08	0.08	0.13
C18:1, g	1.56	0.98	0.84	1.48
C20:1, g	-	-	trace	0.04
C22:1, g	-	-	trace	trace
Polyunsatur. FA, g	0.31	0.15	0.12	0.50
C18:2, g	0.18	0.11	0.08	0.37
C18:3, g	0.13	0.04	0.05	0.05
C18:4, g	-	-	trace	-
C20:4, g	-	-	trace	0.03
C20:5, g	-	-	trace	trace
C22:5, g	-	-	trace	trace
C22:6, g	-	-	trace	trace
Cholesterol, mg	-	11	14	14
Phytosterol, g	-	-	trace	-
Tryptophan, g	0.084	0.044	0.046	0.017
Threonine, g	0.268	0.163	0.149	0.046
Isoleucine, g	0.338	0.207	0.199	0.056
Leucine, g	0.587	0.314	0.322	0.095
Lysine, g	0.513	0.290	0.261	0.068
Methionine, g	0.155	0.080	0.083	0.021
Cystine, g	0.035	0.046	0.030	0.019
Phenylalanine, g	0.284	0.155	0.159	0.046
Tyrosine, g	0.281	0.179	0.159	0.053
Valine, g	0.448	0.240	0.220	0.063
Arginine, g	0.198	0.119	0.119	0.043
Histidine, g	0.167	0.089	0.089	0.023
Alanine, g	0.269	0.118	0.113	0.036
Aspartic acid, g	0.328	0.210	0.250	0.082
Glutamic acid, g	1.019	0.626	0.689	0.168
Glycine, g	0.041	0.050	0.070	0.026
Proline, g	-	0.368	0.319	0.082
Serine, g	0.492	0.181	0.179	0.043

high have commercial importance in cheese making, because they influence stability, cheese yield and flavor (Meunier & Lenoir, 1986; Martin, 1993; Chianese et al., 1993; Heil & Dumont, 1993; Kalantzopoulos, 1994), and which have a potential but yet poorly understood role in human nutrition (Heanlein, 1991). Genetic polymorphisms of beta-globulin, alpha-s-1-, beta-, and kappa-casein affect firmness and viscosity of yoghurt, rennet coagulation time, and syneresis, heat stability, contents of protein, total solids, phosphorous and pH. Amino acid substitutions have been identified for the DNA sequence of caprine, ovine and bovine milk protein genes (Martin, 1993; Folch et al., 1994) and have been related to the different behavior of milk proteins in processing. Some goats milk has low casein contents and unsatisfactory rennet coagulation ability, which affects cheese yield (Meunier & Lenoir, 1986; Ambrosoli et al., 1988). Goats milk casein has the same four proteins, alpha-s-1, alpha-s-2, kappa and beta, as cows milk casein, but genetic differences by breeds and individuals in alpha-s-1 casein range quantitatively from zero or "null type" (O) to "low types" (F, D) and "very high types" (A, B, C), with intermediate classes (E). Some goat and sheep breeds differ significantly in the frequencies of the polymorphic loci of milk protein types (Jordana et al., 1995) (Table 7), with considerable processing and nutritional consequences. Low alpha-s-1 casein types of goats milk have shorter coagulation time and weaker resistance to heat treatment than high types. Curd firmness at 30 minutes of high type milk is greater than that of low type milk. Contents of total solids, total proteins, casein and phosphorous are higher in high type milk and pH is lower. Longer coagulation time of high type goats milk is due to alpha-s-1 casein delaying curd formation by trapping calcium ions and withdrawing them from the sololysis of kappa casein. High type has higher cheese yield, better curd firmness, which is associated with lower pH. Despite longer coagulation time, goat milk of the high alpha-s-1 casein type is more suitable for cheesemaking because of firmer curd, higher casein content, less intense goat flavor and smoother cheese texture, yet it may be that low type has the advantage in human digestion. Beta-casein types also affect cheese making properties of goats milk (Chianese et al., 1993) and alpha-s-1 and beta-casein loci need to be considered together in selection. Sheep's milk also has polymorphisms in its proteins, but this research is

just beginning.

Amino acid substitutions in milk proteins can also be responsible for flavor and its intensity (Rystad et al., 1990). The amino acid threonine is considered the most important precursor of acetaldehyde, which is the main volatile aroma compound in yoghurt. The higher level of glycine in goat milk compared to other species milks may reduce acetaldehyde production from threonine by inhibiting the enzyme threonine aldolase. Ultrafiltration removal of glycine increased acetaldehyde production in goats milk. Addition of threonine resulted in increased acetaldehyde production in goats or cows milk, but goats milk had less. Goats milk with added threonine had less production of lactic, more pyruvic, acetic and less orotic acids; and there are other amino acid differences between goats and cows milk (Rystad et al., 1990).

STAGE OF LACTATION

Within species within breed it is stage of lactation, regardless of species or breed that has the greatest influence on milk composition. Days in milk during lactation regressed on ewes milk component contents had coefficients up to 0.71 (Casoli et al., 1989). Many components in ewes or goats milk as in cows milk, especially fat and protein are high in colostrum in early lactation, much lower thereafter until they rise again markedly at the end of lactation, when yields are low (Antifantakis & Kandarakis, 1980). Fat contents in goats milk changed from 2.7% in mid lactation to 4.6% during the last week 42 of lactation, protein contents in goats milk changed from 3.0% to 4.2% (Voutsinas et al., 1990).

Mineral contents also increased with stage of lactation, Ca from 135 to 150 mg/100 g; P from 99 to 122; Na from 50 to 56; Mg 13 to 15; except K decreased from 170 to 144; and citrate from 145 to 81 mg/100 g.

DAILY VARIATION

Between morning and evening milkings in the same day the gross composition of

milk may also change (Simos et al., 1991), which again may be confounded with milk yield levels, when the milking interval between evening and morning milking has more or less hours than between morning and evening milking. Fat contents of evening goats milk averages 5.1% after 14 hours of milking interval, morning milking 5.3% after

Table 6. Relative composition of ewes and goats milk in relation to the composition of human milk = 100 (Posati & Orr, 1976)

	Ewes	Goats	Cows
Solids, total	154	104	96
Energy	154	99	87
Protein	580	346	319
Fat	160	94	76
Lactose	78	64	68
Minerals	480	410	360
Ca	603	419	372
Fe	333	167	167
Mg	600	467	433
P	1128	793	664
K	267	400	298
Na	259	294	288
Zn	?	176	224
Ascorbic acid	83	26	19
Thiamin	464	343	271
Riboflavin	986	383	450
Niacin	236	156	474
Pantothenic acid	182	139	141
Vitamin B6	?	418	382
Folacin	?	20	100
Vitamin B12	1580	144	793
Vitamin A	65	88	48
Saturated fatty acids	229	133	103
C4:0 butyric	2000	1300	1100
C6:0 caprioc	1400	900	600
C8:0 caprylic	1400	1000	400
C10:0 capric	667	433	133
C12:0 lauric	92	46	35
C14:0 myristic	206	100	106
C16:0 palmitic	176	99	96
C18:0 stearic	310	152	138
Monounsaturated FA	104	67	58
C16:1 palmitoleic	100	62	62
C18:1 oleic	105	66	57
Polyunsaturated FA	62	30	24
C18:2 linoleic	49	30	22
C18:3 linolenic	260	80	100
MCT-FA C6:0-C12:0	288	178	84
Cholesterol	?	79	100
Tryptophan	494	259	270
Threonine	583	354	324
Isoleucine	604	370	355
Leucine	618	330	339
Lysine	754	426	384
Methionine	738	381	395
Cystine	184	242	158
Phenylalanine	617	337	346
Tyrosine	530	338	300
Valine	711	381	349
Arginine	460	277	277
Histidine	726	387	387
Alanine	747	328	314
Aspartic acid	400	256	305
Glutamic acid	606	373	410
Glycine	158	192	269
Proline	?	449	389
Serine	1144	421	416

10 hours, total protein contents were 54% versus 3.58%, and total solids were 13.94% versus 14.03%, respectively. Studies with the milking intervals of 8 and 16 hours differences were 0.39% fat and 0.05% protein, respectively (Merin et al., 1988).

SEASON

There are also clear seasonal differences in milk composition of the major and minor components (Renner, 1982), but they are confounded with climate and diet effects. Winter climate can affect milk yields and composition, and both are negatively correlated. Winter feeding is providing usually different proportions and qualities of grazing, hays, silage and supplements, which influence milk composition considerably. Milk C18:0, C18:1, 18:2, C18:3 fatty acids have been found to increase in summer, while C4 to C16 fatty acids were reduced significantly. The seasonally limited production of ewes and goats milk has stimulated interest in overcoming this handicap by various means, including hormonal induction of lactation (Alifakiotis et al., 1980). Normal milk contents of fat, lactose, chloride, total solids, acidity and pH have been obtained.

PARITY

Differences due to parity, number of lactation or age of animal can be significant in gross milk composition, but this is also confounded with milk yield levels (Casoli et al., 1989). Average fat contents of ewes milk changed linearly from 1st to 6th parity from 6.8% to 7.4% and total protein contents from 5.8% to 6.2% for the Friesian breed in Italy. Parity seems to have little effect on contents of amino acids, fatty acids or minerals (Casoli et al., 1989).

TYPE OF DIET AND PHYSIOLOGICAL STATUS

Regardless of genetics, the composition of the daily diet in relation to production requirements can cause significant changes in milk composition (Morand-Fehr, 1982; Haenlein, 1995). In general terms, 3% of body weight is a minimum requirement of daily dry matter intake for most goats, but high producers will need at least 5%. In order to cover nutrient needs of high production, the energy and protein density of the daily diet intake must increase, because of the limitations of rumen in volume capacity. Ruminants like grass, hay or silage's are mostly low energy and protein density because of high fiber and/or water contents. Starchy supplements like cereal grains or fats and fatty seeds from sunflowers or roasted soybeans increase the energy density of the daily diet, and meals increase the protein density.

Goats and ewes like other ruminants require a daily minimum of long fiber in the diet to prevent acidotic rumen conditions, which lead to fatal parakeratosis and enterotoxemia, or at least to laminitis, significantly depressed milk fat contents, but also possibly increased milk protein contents (Merin et al., 1988).

A more intensive feeding system can be appropriately devised with a complete diet of hay and silage and concentrates mixed together loose (TMR, Total Mixed Ration) or in pelleted or cubed form (Cavani et al., 1991). This causes usually higher milk yields, changes in milk fat and protein contents and also different cheese making properties.

Energy shortage in the diet can change the fatty acid composition of milk fat towards more medium-chain fatty acids, while daily milk yield may decrease and fat content increase (Morand-Fehr, 1981). When grain concentrate supplementation makes up more than 50% of the daily dry matter intake by goats, decreased chewing, less rumination and shortage of salivation of rumen contents occurs (Kawas et al., 1991). To prevent a decreased rumen pH, the feeding of buffers like sodium bicarbonate and magnesium oxide is beneficial. This has been shown in several studies,

where yields were even increased while restoring milk fat contents to normal levels (Hadjipanayiotou, 1988). Increasing energy density by adding fat within narrow limits to the diet, can increase yield of milk, fat, total protein and casein contents (Morand-Fehr, 1981). Also the type of protein in the diet and its rumen degradability can affect milk yield, contents of fat protein, and processing properties (Andrighetto & Bailoni, 1994). Nutritional physiology and endocrine status of the animal affects milk yield and composition over short or longer time periods. This has

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Table 7. Mean allelic frequency of polymorphisms of alpha-s-1-casein in European goat breeds (J. Jordana et al., 1995)

Polymorphic type	A	B	C	E	F	D+O
Murciana-Granadina (109)	0.08	0.23	-	0.59	0.08	0.02
Malaguena (373)	0.09	0.09	-	0.65	0.04	0.13
Payoya (111)	0.05	0.19	-	0.76	-	-
Canaria (74)	0.28	0.32	-	0.20	-	0.20
Palmera (22)	0.68	0.23	-	0.09	-	-
Majorera (21)	0.07	0.38	-	0.24	-	0.31
Tinerfena (31)	0.15	0.35	-	0.32	-	0.18
Alpine - France (213)	0.14	0.05	0.01	0.34	0.41	0.05
Alpine - Italy (80)	-	-	-	0.35	0.59	0.06
Saanen - France (159)	0.07	0.06	-	0.41	0.43	0.03
Saanen - Italy (70)	0.03	0.03	-	0.49	0.46	-
Poitevine (209)	0.05	0.35	-	0.45	0.14	-
Corse (106)	0.06	0.13	-	0.14	0.59	0.08
Rove (147)	0.12	0.05	-	0.62	0.10	0.11
Garganica (54)	0.61	0.37	-	-	0.02	-
Maltese (81)	0.33	0.28	-	0.11	0.27	0.01

Table 8. Changes in physico-chemical properties of Kopanisti cheese during ripening (Anifantakis, 1991)

	Days of ripening				
	1	8	16	32	46
Moisture, %	53.5	52.8	52.5	52.3	52.1
Fat, %	22.0	22.3	22.5	22.5	22.7
Proteins, %	17.8	18.2	18.7	19.0	19.3
Casein, %	16.5	16.1	15.5	14.3	13.6
Soluble N, % of total N	7.4	11.7	16.5	24.2	28.9
Non-protein N, % of total N	3.9	8.6	13.3	20.4	24.6
Amino acid N, % of total N	0.7	0.9	1.2	3.6	6.6
Free amino acids, mg/g non-fat DM	48.4	136.8	209.3	355.9	421.1
Free fatty acids, g/kg cheese	2.3	5.7	11.9	29.9	50.2
Acid degree value	2.9	8.2	20.1	57.1	95.6
pH	4.9	4.8	4.6	4.7	4.8

BACK TO THE BASICS

THE 13TH ANNUAL AMERICAN CHEESE SOCIETY CONFERENCE

AUGUST 1 - 4, 1996

@ THE CULINARY INSTITUTE OF AMERICA, HYDE PARK, NEW YORK

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Information regarding things to do in the area and brochures from the conference hotel have been included in this newsletter, we will include even more information in the 3rd Quarter '96 newsletter.

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The American Bounty Restaurant - Celebrates our nation's diverse cultural heritage with seasonal menus which emphasize regional ingredients and preparations.

We need sponsors! Anyone interested in sponsorship for the 13th Annual ACS Conference please contact one of the following people:

David Haebekorn - San Francisco Cheese 414-648-8108

Fermo Jaekle - Roth Kaese 201-543-5701

Kathleen Shannon-Finn - Columbus Distributing 510-429-6860

Dutchess County, New York is a scenic area with low rolling hills, second growth woods, a mix of dairy farms, estates, and rural life. The Hudson River can be viewed from little villages such as Millbrook and Rhinebeck; and FDR's home in Hyde Park. The county was once the center of New York's apple growing industry. More information on local tours for Sunday, August 4, 1996 will be available next issue.

The main hotel for the Conference is:

The Sheraton Hotel Poughkeepsie
40 Civic Center Plaza
Poughkeepsie, NY 12601
914-485 5300

A rate of \$55.00 per night has been reserved for ACS Members, call or use bounce back cards included in this newsletter.

Bed & Breakfast Setting:
(rates vary)

Beekman Arms
4 Mill Street (Route 9)
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914-876-7077

Other hotels in the area:
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KAZAKHSTAN DAIRIES

y: Lynne D. Edelson

had the good fortune of being asked by Brock International to go to the newly independent country of Kazakhstan last Fall and in this past February. I stayed one month on my first trip and three weeks with a dairy scientist and financial consultant this last one. Kazakhstan is about four times the size of Texas just west of China and south of Siberia. It is one of the few U.S. nations that is not embroiled in civil political strife. The land is rich in natural resources and cultural history and the Kazakh people are friendly and eager to adapt to their new capitalistic society. My initial assignment was to work with a cheese plant in Talgar, a town about forty minutes outside Almaty, the capital of Kazakhstan. The upgrading of the dairy plant and plant was a joint project funded by the US and Israel, and they decided that was time to bring in a marketing specialist that was also familiar with dairy products.

The situation that I discovered on my first visit was that the milk obtained from the Alma-Ata Dairy Farm was tested only for fat and acid content at the Alma-Ata Dairy Plant, and there remained some doubt as to the quality and safety. I recommended that a dairy scientist accompany me on the follow up because I found "red flags" at both the dairy farm and the dairy plant. Lack of proper sanitation techniques, insufficient cooling of milk, problems with Mastitis, and the pasteurized packaged milk had a shelf life of only 36 hours. This was an important issue in any future marketing plans that would include value added dairy product. Part of the initial report from Phase I dealt with these health issues and I am pleased to report that Alma-Ata is currently testing for microbes to ensure the safety of all their milk and dairy products.

The only consumer friendly packaged product that was sold at that time was pasteurized unhomogenized milk packaged with the equipment provided by the Israelis. I suggested that they begin to package other dairy products and develop a trademark/logo that would clearly identify Alma-Ata and their village Talgar in the Almaty marketplace. Alma-Ata purchased additional packaging equipment and they now have packaged fruit yogurt, Kefir, and Smetana, a cultured cream product, all of which are high profit items.

They were in the early stages of retail/customer development during my first visit. They now have negotiated contracts with retailers that reflect current increased prices and delivery costs. At present, they have tripled their gross sales since last Fall. This was achieved even with a natural decline of available milk from the dairy farms due to natural seasonal fluctuations. This substantial increase in sales is attributed to better testing techniques of the milk at the dairy plant that ensure a higher quality product and thus positive consumer response and loyalty, increased prices, increased retail outlets, increased product selection, and the packaging of several of the dairy products to make them consumer friendly. Contracts with retail outlets include freshness guarantees, return credit policy on damaged or unsatisfactory goods, 3% delivery charge and variable price considerations based on amounts ordered and on-time payment status. "The contract requires the stores to have a certificate of quality control so that

dairy products exceeds the available quantity everyday. Alma-Ata sells 1500 Liters of packaged milk and the rest of the 16 Tons is sold bulk out of trucks. They also produce 500 Kilos of Brinza a day up from 50 - 100 Kilos/day six months ago; Smetana is at 1 1/2 metric tons/day; and 300 Kilos of fruit yogurt daily, up from 50 Kilos a day last Fall. They sell everything they make and have not had to accept returns due to spoilage or quality issues. Curds are near impossible to find in any shop. Alma-Ata produces a limited supply that varies daily. We found a long line of women in their farm store as word spread that there was curd available. This is a low profit item but an essential one supplied to the local Talgar residents. They mix it at home with Slivki, which is similar to sweet cream to create Cottage Cheese. Butter has been a low profit item and they are not producing any in the colder months due to the seasonal shortage of available milk.

They are planning on renting floor and refrigeration space in supermarkets that will feature their dairy products and milk exclusively. The plan is to begin with five different stores. One of the advantages of having their own in-store kiosks is to secure the availability of the Alma-Ata products. It will be up to them to keep them well stocked and have "happy cow" signage advertising the Alma-Ata quality. Many of the retail stores I visited were in debt and couldn't afford to buy dairy products on a regular basis. These in-store kiosks will ensure consumers that there will be milk and dairy products for sale. They would like to begin production of other dairy products such as fresh mozzarella, whipping cream, cream cheese, fresh ricotta, and sweet cream and thus create contracts with many of the upscale hotels

and restaurants in the area that are currently importing these goods from Europe at great expense. Many of the executive chefs and owners were interviewed by me during Phase 1, and without exception they said that they could use 50 - 200 Kilos/week on each. They would also like to begin production on a Kazakh dairy product called Narine that is a cultured milk with medicinal herbs added. Local doctors

please see KAZAKHSTAN.....page 10



photo by: Eli Graham

Lynne Edelson with her interpreter meeting with the Executive Chef at the Dostyk Hotel in Almaty

they will handle the Alma-Ata products properly.

Development of a "Happy Cow" company trademark/logo will be utilized on all the Alma-Ata products to create brand loyalty and immediate recognition in the stores and kiosks. They plan to use this logo, once finalized, on all of the milk tank trucks that bring bulk milk to Almaty everyday. In addition, this logo will be used in all print advertising, uniforms, store signage on bulk product, and label design on the packaged goods.

The current demand for fluid milk and all

ALMA ATA DAIRY - RAW MILK QUALITY

y: Dr. Lloyd O. Luedecke - Washington State University



ne assignment to evaluate raw milk quality, processing conditions, and the quality of finished products at the Alma-Ata Dairy Plant was a challenging one. The plant was originally state owned, built in 1959, and had a reported processing capacity of 160,000 pounds per day. The majority of most of the equipment in the plant was unknown, definitely well used, and still functional. The plant had recently been equipped with additional Israeli "mini" processing equipment through a joint venture between Israel and the US as a demonstration project. The mini HTST pasteurization system could process 2000 pounds per hour and the two 1 liter plastic pouch filling machines could fill and seal out 1000 pouches per hour. In addition to the Israeli equipment, the older larger capacity equipment in the plant was also used. Other products made by the Alma-Ata Dairy were: Brinza, a fresh unaged cheese similar to Queso Fresco, Smetana, a cultured cream product containing approximately 20% milkfat, yogurt, cheese curds, and ice cream.

First impression of the plant suggested the operation would not be acceptable in the US. Closer observations revealed that one time the plant was well designed with a typical flow through operation, that the floors and walls were tiled, and modern equipment was utilized. The employees were obviously competent and knowledgeable about processing procedures. However, the lack of money to maintain and repair the facilities and equipment was apparent.

All of the milk processed originated from two dairy herds on the Alma-Ata Private Peasant Farm. Each herd was approximately 1000 cows with 800 milked any one time. The cows were milked three times a day in flat stanchion barns.

The explanation given for three times day milking was that about 15% more milk could be obtained and with milk in short supply the additional milking was justified. As a part of the joint US Israeli project, a new milking parlor has been built and equipped with the latest in milking equipment from Israel. The new parlor will be on line in the Spring of 1996. Currently, the milk is cooled at the farm to 50 F. and delivered each morning to the dairy plant. During February, daily production from 1600 cows was 28,000 - 30,000 pounds. Production will increase to about 44,000 pounds in the Spring and Summer when better feed becomes available. The average annual fat content of the milk is 3.6% and protein is 3.1 - 3.2%.

Tests used to evaluate milk quality each day are odor, titratable acidity (TA), and the methylene blue reduction test is used to estimate bacterial numbers. No mastitis screening tests or direct microscopic somatic cell counts were done. Testing for antibiotics was not necessary because antibiotics are not readily available to treat mastitic animals. Local regulatory agencies exist and can monitor quality standards by either taking samples or examining records at the plant. A 1979 copy of their Standard Methods for the Examination of Dairy Products was available. This may have been the latest edition. Direct microscopic and somatic cell

counts on one sample were not above the current US standard. Conclusions cannot be drawn from only one sample, but the results were encouraging.

A significant amount of the milk was sold directly to the consumers as raw milk. Tank trucks go to Almaty and consumers come with their own containers to buy their milk supply. Consumers boil the raw milk because they do not have much trust in the local processing operations to provide a safe milk supply. Pasteurization temperatures and times used in the plant were similar to those in the US for fluid milk and cultured products. Both the new Israeli equipment and the older equipment was used to pasteurize products.

Recording charts showed pasteurizing temperatures, who the operators were, and that a temperature comparison had been made with master thermometers. All evidence suggested that the products were receiving an adequate heat treatment, however sanitation after pasteurization needed improvement. For example, fluid milk is not homogenized and the storage tank between the pasteurizer and the packaging operation was an open vat similar to a cheese vat. Frequent agitation was necessary to maintain a uniform fat content. Agitation was accomplished by an employee stirring the vat with a wooden rake. Practices such as

please see RAW MILK

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Photo by: Eli Graham

Mixed Breed Cows posing at the Alma-Ata Peasant Dairy Farm

KAZAKHSTANcontinued.

prescribe it for indigestion and to crease circulation.

The quality of the fluid milk and dairy products at Alma-Ata has improved since the Fall because of the use of better marketing techniques. Their ability to follow through on past recommendations and develop progressive marketing ideas have played an important role in establishing Alma-Ata as a key player in the Almaty region for quality value added products. There are specialty stores catering to the healthy and foreigners that always had imported long-life milk in stock as well as several types of imported cheeses. In addition to the factory Goudas and Edams, I am pleased to find real Roquefort and French sheep's milk cheese. Local shoppers test their luck in the average shops as

RAW MILK.....continued

This probably contributed to the 36 hour shelf life of the packaged milk and confirmed why most consumers also boiled the pasteurized milk supply. All the cultured products, Brinza, Smetana, and yogurt had a clean characteristic desirable flavor and odor. The laboratory manager responsible for maintaining and preparing the lactic cultures was competent and knowledgeable about sanitation and how to manage cultures. Freeze-dried cultures were purchased from Moscow, Russia and were carried as mother cultures prior to preparing the bulk cultures. Culture purity and desirable culture ratios is checked frequently using the microscope and methylene blue stain. Interaction with plant employees revealed that most had either been at this particular plant for many years or had received training and degrees from various institutes. The person handling the cultures was trained as a microbiologist and she was familiar with most of the tests we utilize in

to the availability of any dairy products and could not afford to shop in the upscale stores. Supermarket clerks are rude and most have no training in, the proper handling of perishable goods. All of the dairy products and cheeses I did locate in the average stores were unrefrigerated and handled poorly. Progress in these areas remains slow, but I did find improvement in just the three months between my two visits.

In my current report, I am advising that a dairy specialist with production and cheesemaking experience work at the Alma-Ata Dairy Plant with their staff to increase quality, productivity and assist with the creation of new value added products. If any one is interested they should contact me and I will send the information on to Winrock International. I hope that

the US but thought these tests would not be practical in their current operation. The woman responsible for making the Smetana had five years of training in dairy processing at a dairy institute. Their educational system frequently requires the students to have practical experience before obtaining a degree. This particular employee had worked as a milk receiver and also as a buttermaker. The woman in charge of cleanup had been employed 27 years at the Alma-Ata Dairy. Plant employees work 6 days a week and were paid \$35.00 per month. Plant ownership had recently changed and employees were not eligible to participate in the bonus plan until they had been employed for one year under the new ownership.

Regulatory enforcement pertaining to sanitation and facility inspections may have existed, but were obviously not strictly enforced or high priority items. Employees admitted that prior to privatization of the plant there was little incentive to always do their best and bad sanitation

this program will continue and that I will be invited to return to continue my marketing work with the Alma-Ata Dairy sometime before the Summer. I found this work to be highly rewarding on both a personal and professional level. I got to visit a part of the world that had been closed to Americans for decades and established friendships with people eager to learn and share different ideas. My marketing suggestions were utilized in October and quickly helped to contribute to increased quality and sales. It's not often a person gets to see firsthand the fruits of his or her labors so clearly and the immediate impact they have made. Helping the people of Kazakhstan has been one of the most gratifying experiences in my life.

habits had developed. Lack of money for maintenance of facilities and equipment has contributed to a "make do" attitude. Also the fact that a shortage of milk exists and they sell all their products daily contributes to this undesirable situation.

The overall evaluation was that the Alma-Ata Dairy Plant was operated with some excellently trained and dedicated employees. Changes recommended were to give one employee the responsibility for quality assurance and sanitation throughout the plant. This person would need the support from management and the authority to make changes. Also the plant needs a designated operating budget so plans and goals can be established. Employees realize changes are needed, but they need help to move ahead. Employees cannot be asked to work more, nor will additional employees help, unless funds are available to maintain, repair and replace equipment and facilities.

WES & GOATS...continued been demonstrated for effect of estrogen's during estrus (Haenlein & Krauss, 1974). Matrotropin also will increase milk yield, milk fat content, short-chain and medium-chain fatty acids significantly, while decreasing milk protein percentage, long-chain fatty acids and net energy balance (Disenhaus et al., 1995).

UDDER HEALTH

widely accepted rapid monitor of udder health is the somatic cell count in milk. However, milk secretion in goats is apocrine, while in cows it is merocrine, which explains why goats milk may have very high counts of somatic cells, especially in the lactation milk or in last strippings of milk, without any relation to mastitis (Park Humphrey, 1986; Haenlein, (1993). In cows milk it has been demonstrated that relative and absolute casein content is

related negatively to somatic cells count (Haenlein, 1974). Generally, subclinical or clinical mastitic infections cause the milk contents of casein, lactose and cheese yields to decrease, milk serum albumin, immunoglobulins and salt (NaCl) contents to increase.

PROCESSING

Even before cheese precipitation from milk and the effects of fermenting of cheese, the various methods of processing, heating and freezing can be produced influences on milk composition. Heating is applied during pasteurization, UHT processing, condensing and powder production, which will denature milk proteins to varying degrees and affect flavors (O'Connor, 1994). Freezing is of economic interest because of the seasonal nature of goats and ewes milk production, and because these milks have greater economic

importance than cows milk in some countries (Kalantzopoulos, 1994) (Table 1,2,4). During frozen storage, oxidation of ewes milk occurred and free fatty acid contents increased because milk lipase was not completely inactivated (Anifantakis et al., 1980). Proteins and bacterial counts may remain the stable, and taste and flavor scores do not change. In freezing of cheeses the pH and proteolysis may change (Fontecha et al., 1994). Fermentation during yoghurt processing and cheese ripening also cause significant changes in the composition of the products due to proteolysis, lipolysis, glycolysis, development of flavor compounds and liberation of non-protein N-compounds, free amino acids, free fatty acids and ammonia as extensively documented by (Antifantakis, 1991) (Table 8).

CONCLUSION.....NEXT ISSUE

FROM THE EDITOR

by: Regi Hise

I usually don't begin to write anything for the ACS newsletter until close to the deadline. It's not just because I tend to procrastinate. It also gives me a chance to talk with Debbie Haws about what articles we have and whether there is any particular theme that can be addressed, or topics that are simply missing. When Debbie and I talked the other day (deadline day), there was no doubt about the trend we saw that continues to grow. It appears that the American Cheese Society is very quickly becoming a very worldly society.

Many articles in the ACS newsletter come from members traveling to various parts of the world on business and pleasure. In this newsletter alone we have articles from Gerd Stern in Spain, Avice Vilson's adventures in Australia, A paper from Dr. George Haenlein that he presented in Hersomissos, Crete, Greece last October and Lynne Edelson and Dr. Lloyd O. Luedecke reporting on their visits to Kazakhstan. Many of our members are active in the world of Cheese. We learn a lot from our members worldly cheese experiences. At the same time people all over the world are becoming more aware of the American Cheese society.

This trend is also apparent in other ways. The number in last years ACS cheese competition from other parts of America included Central America, South America and Canada. That forced the board of directors to address, for our purposes, the definition of the word "America." The board voted that the

entries in our competition could come from anywhere in Pan America.

The number of foreign attendees at our annual conference continues to grow and as always programs at our conference have a worldly cheese tone. One example was the response to the story of Metsovo presented at the ACS conference in Rohnert Park, California. It was so moving that Dan Strongin decided to organize a Greek Conference for ACS members.

As a counterpoint, many ACS members have expressed concern over the fact that we seem to be trying to be worldly in scope when we still have so much to accomplish in our mission to make and support world class cheeses in America. I don't think that's the case.

We're not trying to be more worldly, and we're not planning on changing our name to the Pan American Cheese Society. We're simply responding to and learning from our members activities and the history of cheese traditions around the world. It's easy to forget that thousands of years before the United States of America existed man has been enjoying cheese and the rest of the world has a lot of experience for us to draw from. Not only traditions of cheesemaking, but traditions that support an appreciation of quality cheeses, and traditions of how they are used.

As a society we would be missing huge opportunities if we did not continue to network with, learn from and share our experiences with cheesemakers from around the world.

CALENDAR OF UPCOMING EVENTS

by: Dick Groves

(Editor's Note: ACS members are encouraged to let us know about additional upcoming events of interest. Please contact Dick Groves at The Cheese Reporter, 608-246-8430, if you have an event you'd like to see added to this list.)

Israel Dairy World Agritech '96, Tel Aviv, Israel; **May 12 - 16, 1996**. For more information 972-3-5619234 or FAX 972-3-5616118.

IDDA (International Dairy Deli Association) Dairy-Deli-Bake '96, June 2 -4, 1996; Minneapolis, MN. For information call (608) 238-7908.

1st International Conference on Farmstead & Specialty Cheeses, Co-sponsored by the ACS, American Institute of Wine & Food and the Epirus Foundation to be held **June 14 - 16, 1996**; in Metsovo Greece, see itinerary this issue.

IFFCS (International Fancy Food & Confection Show) 42nd Annual Summer Show June 23 - 26, 1996; Philadelphia, PA to be held at the Pennsylvania Convention Center.

ACS (American Cheese Society) 13th Annual Conference @ The Culinary Institute of America in Hyde Park, NY; **August 1 - 4, 1996**; for more information see pg. 11 in this issue.

Bon Appetit Seventh Annual Wine & Spirit Focus; events scheduled: **Dallas - September 19th, 1996**; **New York - September 30th, 1996**; **Los Angeles - October 27th, 1996**; **Chicago - November 15th, 1996**. For information on participation and registration packets call Caryl Chinn @ (212) 880-4830; for information on attending call toll free 1-888-FOCUS96.

ITEMS AVAILABLE FROM ACS OFFICE

Cheese Books	Members	Non-Members	1995 12th Annual Conference Items	
The Great Cheese Book	\$25	\$35	T-Shirt (L or XL)	\$23.50
The French Cheese Book	\$17	\$22	Tote Bags	\$11.50
Hevre! The Goat	\$8	\$10		
Cheese Cookbook				

If you have information or an article you would like considered for inclusion, or drawings and photographs we could use in future newsletters, send them to:
Deborah K. Haws - Publisher
1352 Boyd St.
Cedar Hill, TX 75104
Voice 214-293-3040 Fax 214-293-7035
Note: We have made some changes in the style of this issue as a result of member feedback. Additional comments are welcome.

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