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Dairy and Food Sanitation

A Publication for Sanitarians and Fieldmen

- Milk and Foodservice Programs: Taking Stock as We Enter the 80's
- Tank Calibration — Procedures and Criteria
- Low Temperature Dishmachines
- Is Cooling of Milk Overemphasized?
- Quality of Juice Drinks

A Publication of the International Association of Milk, Food and Environmental Sanitarians, Inc.

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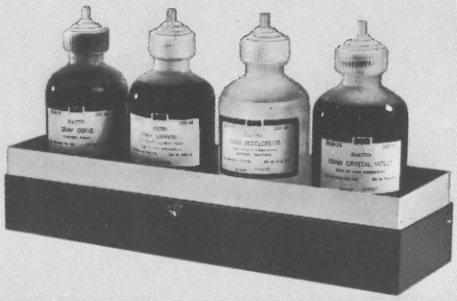

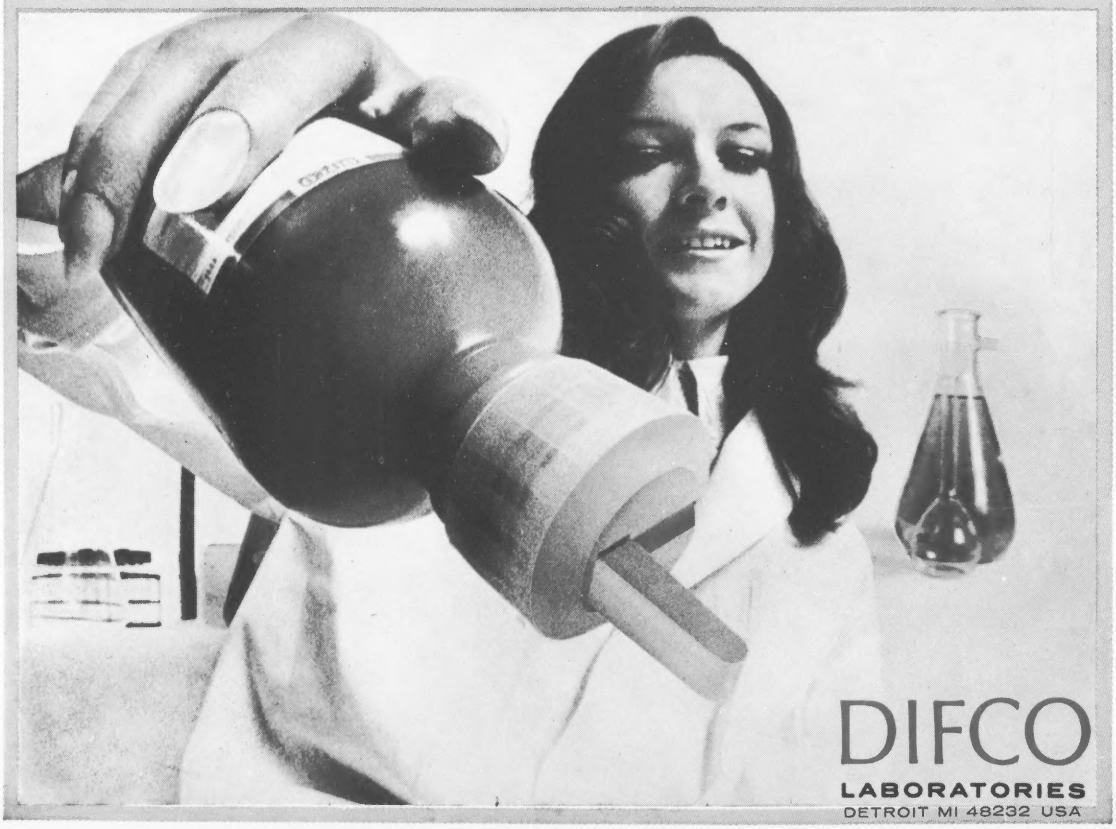

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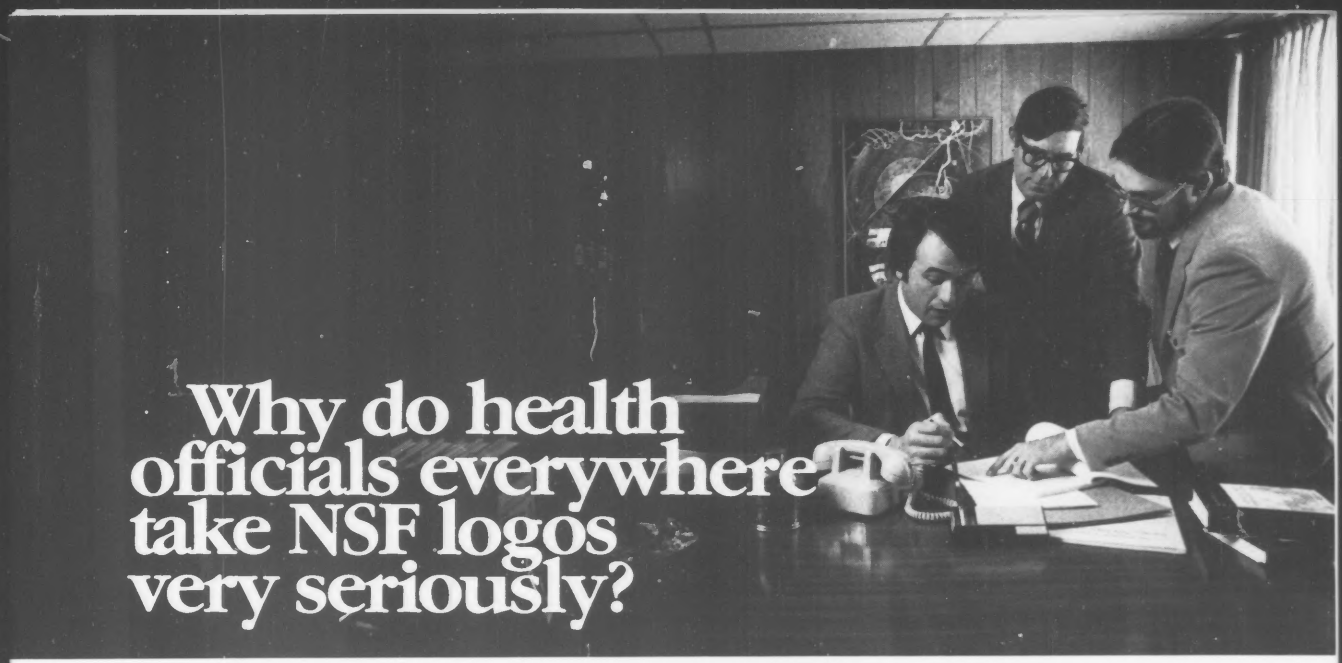

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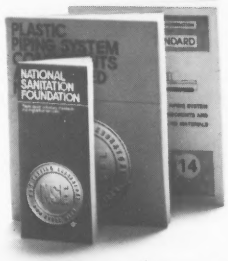

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Dairy and Food Sanitation

May, 1981

Milk and Foodservice Programs: Taking Stock as We Enter the 80's

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A blending of local, state and federal efforts is important is successful milk and foodservice programs. A number of possibilities are discussed for continuing to protect public health and at the same time, cutting program costs and increasing their efficiency. An example of an effective blending of inspection efforts is the IMS program, born in the 1950's. Details of this program are highlighted.

Two areas of food safety programs which are of great concern---and great potential hazard to the consumer if they are not properly carried out---are the milk and foodservice programs.

To assure that they do not present a danger to the public requires an effective combination of state knowledge, expertise, and "person-power," with federal assistance, standards, and program evaluation.

Presented at the 57th Annual Conference of the New York State Association of Milk and Food Sanitarians, Syracuse, NY, Sept. 17, 1980.

The proper mixture of these ingredients can result in a safer food product, as well as a lower cost to the consumer and taxpayer.

First, look at the program which regulates food safety at the retail level. It covers the food store, foodservice, and food vending industries.

Concentrate on the foodservice segment of the program. Food consumed away from home is increasingly viewed as a necessity in the US as trends continue toward more single-member households and smaller family units. About 40% of the household budget is spent in foodservice establishments. Currently one-third of the people in this country eat out at least once a day, and the trend is expected to increase in the 80's.

With over $112 billion in sales, the foodservice industry is the nation's fourth largest retail industry. It has over 520 thousand establishments, making it the leader in the number of retail establishments. It employs over eight million full and part-time persons, making it the nation's largest retail employer.

Center for Disease Control statistics show that in 1978 where foodborne illness outbreaks were caused by mishandling of food, 92.8% of the time it occurred in retail or institutional food service establishments. In contrast, food processing establishments, where food is commercially processed and packaged for market, were not implicated in any outbreaks.

Traditionally, state and local health departments have played a leading role in consumer protection. There are now more than 3,500 state and local agencies regulating foodservice establishments. These agencies need retail food protection programs that are uniform, effective, and fair.

The FDA assists and supports these goals through a strategy which has three basic components:

"CDC statistics show that where foodborne illness outbreaks were caused by mishandling of food, 92.8% of the time it occurred in retail or institutional foodservice establishments. In contrast, food processing estabishments."

First, it is directed to both public health considerations and consumer expectations. Since most foodborne illnesses can be prevented by following good sanitation practices, sanitation standards were developed by the Public Health Service for use of establishment operators and state and local regulatory agencies. These recommended sanitation standards contain overlapping safeguards designed to minimize foodborne illness, and to assure that food is prepared in a clean environment.

Second, the strategy mandates that a basic level of knowledge and uniformity is necessary for successful food protection activities. The program focuses FDA resources on quality training and certification of state regulatory officials and, through them, training for industry personnel. New York State is fortunate in having four excellent FDA certified foodservice officers.

Finally, the FDA tries to maximize the opportunities for industry to voluntarily comply with standards, but also provides for firm, equitable and timely sanctions when these standards are not met. The program identifies and demonstrates new mechanisms for voluntary industry compliance, and provides technical assistance and interpretive guidance to state agencies in the enforcement of FDA's model ordinances.

The Code used today is the fourth, the 1976 revision. FDA uses the Recommended Model Foodservice Ordinance in two main ways:

The first is in connection with the continuing assistance offered to state and local jurisdictions, where most foodservice work is performed. FDA's Retail Food Protection Program is voluntary. For this reason, its work with the states and local agencies has been advisory in nature.

It helps states to adopt uniform laws and regulations and to follow a course of uniform interpretation and equitable enforcement. So far, the FDA has assisted 18 states in the adoption of the 1976 Recommended Code or its equivalent.

The FDA also assists the states and local jurisdictions in identifying and solving problems. As part of this phase of the Program, state foodservice officers trained and certified by FDA are asked to share their knowledge with colleagues on the local level. Making evaluations of local foodservice programs and standardizing local sanitarians are the main mechanisms for accomplishing this.

The second way the FDA has used its Recommended Foodservice Sanitation Code is with its Interstate Travel Sanitation Program. FDA has responsibility for inspecting food facilities on planes, ships, buses, and trains which operate across state lines. This includes all commissaries and caterers who supply food to these interstate carriers.

These caterers and commissaries know if they fall below a certain level in their sanitation rating score, they

will be prohibited from distributing food to interstate conveyances - which effectively puts them out of business. Not too surprisingly, FDA has been able to maintain a high level of sanitation in these establishments. The results are viewed as going a long way to demonstrate that an effective foodservice sanitation program is possible through the use of uniform standards and the fair use of enforcement authority.

What changes can we look forward to in the 80's?

State foodservice program managers have long been aware of the necessity for more cost-effective activities. But exactly how to meet this need is not so clear. In even the first year of the 80's budgets for foodservice work at the state level have already been reduced, either by inflation or in actual line reductions. Trained foodservice personnel have been switched to other duties by managers hard-pressed to cover all tasks.

Running a program which has neither the staff nor the budget to handle the responsibility is something like playing musical chairs. When the music stops, one had better have a chair to sit on or he's out of the game. What would the position be if a major incident of foodborne illness were suffered?

One solution is that functions usually handled at the state level may be assigned to counties or municipalities if they can, or will, take them. However, moving program elements from one jurisdiction to another doesn't really resolve the dilemma of not having sufficient staff to handle the labor-intensive inspectional programs which call for at least two inspections per establishment each year.

Go back to square one and look again to determine, under the conditions now faced, whether current methods of inspecting can continue to be the primary way in which public health is protected. Could the effectiveness of inspections be increased by concentrating on establishments which have a bad history or about which complaints have been lodged? Is it possible that the extremely high turnover rate of employees in foodservice establishments makes such a scheme impractical?

Could public health protection be maintained with an inspection program that focuses attention on only violations which have the highest public health significance? Such abbreviated inspections might allow more coverage with the same number of sanitarians.

Suppose the inspection program was cut back sharply but, at the same time, establishments failing to pass an inspection were dealt with much more strictly, including hearings and local publicity. Would the establishments which weren't inspected get the message?

Should national or regional headquarters of foodservice chains be dealt with directly so results could be used to correct chain-wide problems?

Is enough attention being paid to the health of foodservice workers? Maybe local health offices should be worked with more directly.

Is enough attention concentrated on foodservice programs for aged Americans? Over 12,000 sites nationwide serve 600,000 meals a day, and many of these locations are substandard.

Would an effective program be maintained if a much larger portion of efforts were invested in non-inspectional activities?

Would long-run benefits occur through concentration on plan reviews so problems could be eliminated before they were built into the establishments?

Would a much strengthened educational program including literature, TV appearances, speeches before civic groups, school classes, and senior citizen groups, be effective?

These are just a few ideas presented to stimulate thinking. Many more ideas and much more planning will be necessary before the gap can be bridged between knowing more must be done with fewer resources, and knowing exactly what to do to be successful in the 80's.

There is one cost-effective way to make do with less which can be recommended for closer study. Arrange with the academic community for foodservice training programs. Managers and handlers need to know what the foodservice sanitation problems are and what is expected from them. Such training should be done in full cooperation with the foodservice industry for it is keenly interested in pleasing customers and avoiding disastrous incidents of foodborne illness.

Perhaps the State of New Jersey has shown the way this can be done with its voluntary State-wide Foodservice Manager Certification Program, conducted in cooperation with Rutgers, Princeton, and most community colleges. Monitoring such a program for a State the size of New York would be a big task, but with involvement of industry, the pay-off in cleaner restaurants could be impressive. The FDA would work to assist the State in such a cost-effective program.

The other area which needs to be addressed is the Grade A Milk program:

The role of the Federal Government in this State/Federal consortium known as the "Conference on Interstate Milk Shipments" is unique. Under this unusual partnership, the states do the regulatory work and the Federal Government serves more or less as an umpire to help states

accept each others' inspections.

The Federal Government also serves as an information pool and resource center to help states solve their problems.

The states as a body can exercise joint control with FDA over the rules and states individually can exercise a considerable amount of administrative flexibility. Under this program, many state dairy programs have made major improvements. An example is the progress that has been made in milk safety programs in New York. Four years ago the program was transferred to the New York State Department of Agriculture and Markets. Their success in building a complex milk program providing a high level of public health protection in the third largest dairy state in the nation has been impressive. The New York State Department of Agriculture and Markets and FDA are now communicating well and working together for the resolution of common problems. This is the kind of productive working relationship the FDA wishes to encourage.

The IMS Program was born in the 50's to combat unnecessary expense and confusion caused by uncoordinated, duplicated inspectional efforts. This voluntary coalition devised a system of evaluating Grade A milk supplies on a uniform basis and of listing approved sources of the milk supplies. One key to understanding the Grade A Milk Program, is to remember that the regulatory authority is the state, not FDA. Standards are drafted and recommended by FDA, but they are not federal regulations. To the extent that recommendations are adopted by the states, they become state law and the state provides the regulatory enforcement.

Even though FDA has legislative authority and responsibility for milk safety under the Food, Drug, and Cosmetic Act, it has neither federal regulations, person-power, nor motivation to insert itself as the regulatory agency in areas which are traditionally state's responsibility. This should continue in the 80's as state programs continue to provide high and improving levels of public health protection.

Last year, over 500 FDA check-ratings were made in the 50 states. Check-ratings results are classified as satisfactory if the rating is sustained. If the listed rating is not sustained and a re-rating reinspection, or an immediate withdrawl of Interstate Certification is requested, these check-ratings are classified as "adverse". There were 95 adverse actions in the United States last year, or approximately one in each five check-ratings that required a review or change in the listed rating.

In Region II, which includes New York and New Jersey, 41 check-ratings were made last year. Sanitation conditions requiring 11 adverse actions were found, or about one adverse action in each four check-ratings.

When deviations from the standards are serious enough, FDA can recommend that a firm be immediately delisted or withdrawn from interstate certification. There were 35 withdrawls in the nation last year, for a rate of about 5%. Of these five withdrawls were in New York and New Jersey last year, for a rate of about 11%.

Looking at past statistics, these figures show an improvement. Furthermore, the adverse action rates so far this year indicate a continuation of that improvement. As these adverse action rates are still above the national average continued efforts to reduce sanitation problems are still needed.

The 1978 PMO is similar to the 1965 Ordinance which it replaces. It was adopted by the Interstate Milk Shippers Conference in May of 1979. In accepting this document, the Conference took exception to several provisions and suggested alternatives. All these suggestions have now been accepted by FDA. The Conference decided that most of these new changes would go into effect on July 1, 1980 and the transition has mainly been a smooth one.

In addition to FDA's role as umpire and joint rule maker with the states, it does, upon request, provide technical assistance and training. This includes workshops, formal training courses, and one-on-one field training tailored to state needs.

Both FDA Headquarters and specialists in the field want to be sure that all Federal help doesn't inadvertently get in the way of the states' efforts to improve their own milk protection programs. One way to assure this is to tailor FDA assignments so as to give states as much time as possible to solve their own problems. The Milk Safety Branch, has reiterated its determination to listen attentively to the states prior to making program changes.

A change in the check-rating assignments will be made in February, 1981 to set the number to be done so as to maintain a 65% confidence level. In the past, these figures have been set so that more than a 65% confidence level was obtained in some states. To the FDA, it is much more desirable to have on national confidence level rather than several.

There are still problems to face in this area, as well as in areas in milk and foodservice programs, but they will be overcome if the State and Food and Drug Administration continue to work together to solve them.

Through combined efforts the Grade A milk and foodservice establishments have been sprinkled with just enough State/Federal cooperative salt to season them and to make their products safer.

Tank Calibration– Procedures and Criteria

A good deal of time and effort goes into calibration of farm bulk tanks, but benefits include a more accurate measure of production and costs.

ALVIN GONINEN, JR.

AMPI, 8550 W. Bryn Mawr, Chicago, IL 60631

One company's procedures for farm bulk-tank calibration are detailed, step-by-step. Two important points to be observed and checked first in calibration are: producer information and tank information. All tank information should be the same as listed on the chart. The comparison of new with old readings, and a partial example of a tank calibration chart is included. One very important aspect of using the tank calibration charts - a fieldman should always present the chart to the farmer in person and be able to explain any chart variations. This helps maintain a good relationship between the producer and the fieldman.

At first glance, the steps in a tank calibration process appear involved and difficult. Where, exactly, is the starting point? What does it take, anyway, to develop a calibration chart?

A good deal of time and effort, but benefits include a better relationship between farmer and fieldman, and fair, accurate production costs.

Two important pieces of information must be observed and checked in the first step as they are basic in making a new calibration chart. Producer information (name, plant, producer number, fieldman's name) and tank information, read from the tank itself (brand name, model and serial number), are what's needed. It is essential that all tank information be the same as listed on the chart.

The next step involves some housecleaning. The tank gauge must be thoroughly cleaned with hot water and scrubbed with an abrasive cleanser, rinsed, dried, and dusted again with powder. Failure to do this properly can result in an uneven line and a false reading.

The tank should be set--level--after it is placed solidly on the floor. The gauge should be perfectly vertical while sitting solidly on the supporting bracket. The wall of the tank should be wet and drained at least 30 seconds.

The chart is then checked for a set in gallonage. If this information is not given, it should be in the range of 10 to 15 percent of rated tank capacity. This figure must be divisable by even five-gallon amounts. On the example tank, it must be set with 15 gallons of water to a stick reading of 4 16/32.

Next, a series of check readings are made:

15
30
45
60
75
90
105
120
135
149

Nothing can be taken for granted as far as the old chart is concerned. For example, this particular tank holds only 149 gallons. The original chart indicated it would hold 165 gallons.

Because this tank holds only 149 gallons, the new chart has to be based on the nearest gallonage that is divisable by an even five gallons. Therefore, the capacity of the new chart will read 145 gallons.

Compare new readings with old chart readings:

Gal.	Stick	Old chart	Error
15	4 16/32	4 16/32	0
30	7 18/32	7 18/32	0
45	10 6/32	10 7/32	-1
60	12 20/32	12 21/32	-1
75	15 0/32	15 0/32	0
90	17 13/32	17 14/32	-1
105	19 28/32	19 28/32	0
120	22 17/32	22 17/32	0
135	25 20/32	25 19/32	+1
145	27 23/32	27 21/32	+2

Error is shown as increments on the stick. The actual variation in pounds can easily be determined by comparing the total weight of water (816 pounds per gallon) as shown on the test draft with the reading at that

weight on the old chart.

After the tank is filled to capacity, there are three possible options:

- Do nothing

  This is what should be done in the above example. The variation is within .4 percent of a meter. If a prover pail had been used, it would have had to be within 12 percent.

- Reset

  The following test result would indicate the variation is constant. If the tank is moved three marks at any one point, it will change all test readings the same. So, to correct, the entire tank will be drained, then refilled with the set in gallonage, and adjusted to the desired stick reading (15 gallons to read 13/32). This procedure allows the tank to be moved with a minimum amount of load in it.

Example readings for resetting:

Gal.	Stick	Old chart	Error
15	4 16/32	4 13/32	+3
30	7 18/32	7 15/32	+3
45	10 6/32	10 3/32	+3
60	11 20/32	11 18/32	+2
75	15 0/32	14 29/32	+3
90	17 13/32	17 10/32	+3
105	19 28/32	19 25/32	+3
120	22 17/32	22 13/32	+4
135	25 20/32	25 17/32	+3
145	27 23/32	27 20/32	+3

(Note: the tank still has variation in it after it has been reset, but it will be within tolerance.)

- Make a new chart

  If the variation is not constant, a new chart is the only way to correct it.

Example readings which would require a new chart:

Gal.	Stick	Old chart	Error
15	4 16/32	4 16/32	0
30	7 18/32	7 18/32	0
45	10 6/32	10 9/32	-3
60	12 20/32	12 24/32	-4
75	15 0/32	15 4/32	-4
90	17 13/32	17 16/32	-3
105	19 28/32	19 28/32	0
120	22 17/32	22 15/32	+2
135	25 20/32	25 16/32	+4
145	27 23/32	27 19/32	+4

(Note: Variation of error is beyond tolerance of .4 percent. The tank cannot be reset to correct this variation.)

After the findings of the tank test have been evaluated and explained to the producer, it is important to ask him to sign the test report. If the fieldman wishes, he may sign for the producer. It may also be advisable to record on this form any action taken.

It is extremely important that the person checking the tank calibration understand how the chart is made. Though he need not carry out the process, he must be able to properly present the new chart to the farmer.

In order to develop a chart it is necessary to assign a given amount to each five-gallon reading. This is done by a process called hashing. This hash value is determined in the following manner. First, the total number of marks between stick readings must be established:

CALIBRATION CHART FOR 145 GALLON ZERO PRODUCERS COLD WALL TANK

INSTALLED AT PERMIT 00420 REG DIV P/A MODEL NO.

TANK NUM 2

SERIAL NO. 1-7-64
STICK NO. 1-7-64
INSTALLED - -
CALIBRATED 09-09-27

DEPTH GIVEN IN INCHES AND 32NDS

INS DEPTH	POUNDS MILK	INS DEPTH	POUNDS MILK	INS DEPTH	POUNDS MILK	INS DEPTH	POUNDS MILK	INS DEPTH	POUNDS MILK	INS DEPTH	POUNDS MILK	INS. DEPTH	POUNDS MILK
4 IN		5 IN	150	6 IN	192	7 IN	234	8 IN	279	9 IN	329	10 IN	378
1		1	151	1	193	1	235	1	281	1	330	1	379
2		2	152	2	194	2	236	2	283	2	332	2	381
3		3	154	3	195	3	238	3	284	3	333	3	382
4		4	155	4	197	4	239	4	286	4	335	4	384
5		5	156	5	198	5	241	5	287	5	336	5	385
6		6	158	6	199	6	242	6	289	6	338	6	387
7		7	159	7	201	7	243	7	290	7	339	7	389
8		8	160	8	202	8	245	8	292	8	341	8	390
9		9	162	9	203	9	246	9	293	9	342	9	392
10		10	163	10	205	10	247	10	295	10	344	10	394
11		11	164	11	206	11	249	11	296	11	346	11	395
29	146	29	188	29	230	29	275	29	324	29	373	29	425
30	147	30	189	30	231	30	276	30	326	30	375	30	427
31	149	31	190	31	232	31	278	31	327	31	376	31	428

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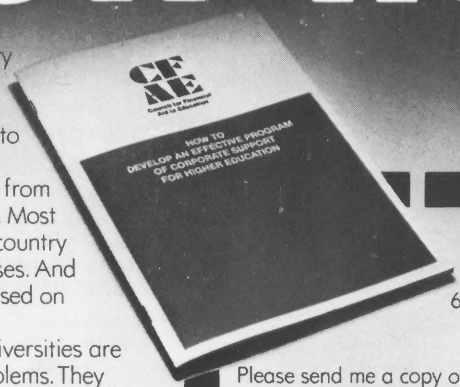

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Example of chart hashing procedure:

Gal.	Stick reading	Increments	Hash total
15	4 16/32		33
			33
30	7 18/32	98	32
			28
			28
45	10 6/32	84	28
			26
			26
60	12 20/32	78	26
			26
			25
75	15 0/32	76	25
			25
			26
90	17 13/32	77	26
			26
			26
105	19 28/32	79	27
			28
			28
120	22 17/32	85	29
			33
			33
135	25 20/32	99	33
			33
145	27 23/32	67	34

	Stick reading			Increments
From	4 16/23	to	5 0/32 =	16
"	5 0/32	to	6 0/32 =	32
"	6 0/32	to	7 0/32 =	32
"	7 0/32	to	7 18/32 =	18
			Total	98

In order to continue the process, the number of five-gallon measurements must be determined:

From 15-30 gallons there are three five-gallon measurements

15-20 gallons = five-gallon

20-25 gallons = five-gallon

25-30 gallons = five-gallon

Therefore, the total 98 marks must be divided by three. This division leaves 32 marks with a remainder of two. There will be one 32-mark, one 33-mark and another 33-mark, for a total of 98.

This information is transferred to an adding machine tape. A proving formula, which serves as a check for accuracy, is attached to the tape. This tape, along with an input slip of the producer and tank information, is processed and printed by computer.

The two copies of the print-out are returned to the person who provided the input information. After print-out errors are checked, the two copies are mailed to the field representative.

One copy is sleeved in a moisture-proof plastic cover for milk house use. The second copy is for the plant file. The input and test information is kept on file for future reference by the person responsible for the input information.

The next step, a very important one, is presenting the chart to the farmer. This should always be done by the fieldman, in person. A chart should never be sent with any individual who does not fully understand that any chart made today is from a series of basic readings and averages. These averages may appear in different places on any chart, depending upon the manner in which they are presented and computed.

In the example chart all test readings are underlined to show they are the same as the test reading. All other figures are averaged. These averages are also influenced by odd and even numbers and fractions, which are always expressed to the nearest whole amount.

Again, it is essential that the presenting individual can explain chart variation. The example chart is a very simple one, but it could be printed in excess of 1500 variations, and any of them would be considered correct by the Federal Standard of Weights and Measures.

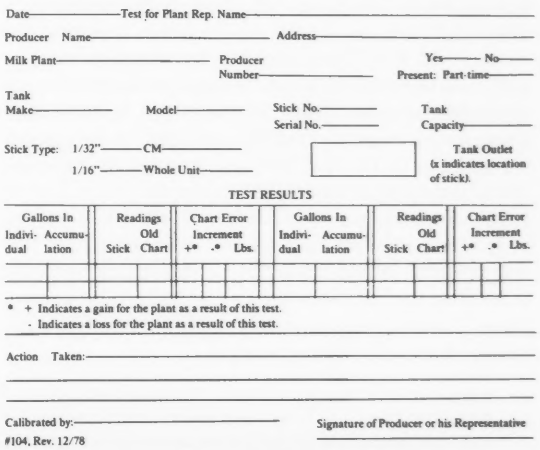
Use of a little knowledge in this area can help maintain a good relationship with the producer. It makes it possible to avoid such pitfalls as finding two charts on the milk house wall, with both being used to the best advantage of the farmer and the hauler.

For instance, perhaps the hauler has noticed a variation and has already convinced the farmer the new chart is in error. It is recommended that all copies of the old chart be removed from the milk house and placed in the farmer's file.

Care of the chart is also an important factor because of equipment, material, time and postage. When the chart is put in the milk house it should be handled in the following Manner:

- Hung on a finishing nail (to avoid a hole in the plastic cover that will let moisture enter).
- Located in as dry a spot as possible.
- Protected from direct sunlight which would fade the computer ink.

The development, use and care of an accurate


Date——Test for Plant Rep. Name——
Producer Name——Address——
Milk Plant——Producer Number——Yes——No——Present: Part-time——
Tank Make——Model——Stick No.——Serial No.——Tank Capacity——
Stick Type: 1/32"——CM——1/16"——Whole Unit——
Tank Outlet (x indicates location of stick).
TEST RESULTS
Gallons In Individual | Gallons In Accumulation | Readings Old Stick | Readings Old Chart | Chart Error Increment +• .• Lbs. | Gallons In Individual | Gallons In Accumulation | Readings Old Stick | Readings Old Chart | Chart Error Increment +• .• Lbs.
• + Indicates a gain for the plant as a result of this test.
- Indicates a loss for the plant as a result of this test.
Action Taken:——
Calibrated by:——
Signature of Producer or his Representative
#104, Rev. 12/78

calibration chart is often a difficult, detailed process. But accuracy in weights and measures leads to fair production prices and, perhaps more importantly, to a solid relationship between farmer and fieldman.

LOW-TEMPERATURE DISHMACHINES SAVE ENERGY, MONEY AND H_2O

DOUGLAS J. SMITH

Vice-President for Design and Construction at Host International, Inc.

Conventional high-temperature-rinse sanitizing dishmachines can consume up to one-third of the energy used in many operations. How is this possible? During the winter, ground water temperatures can drop to 40°F. This cold ground water must be heated to 160°F initially to comply with National Sanitation Foundation (NSF) wash tank requirements and secondarily to 180° to comply with NSF sanitizing rinse requirements. At normal, rated flow pressure of 20 pounds per square inch (psi), the common single-tank conveyor dishmachine which is rated at 190-220 racks per hour, will consume between 416 and 450 gallons per hour of 180° water.

During that same theoretical hour's operation, a 525,000 BTUh input gas or 125 KW electric primary water heater will have been in operation, a 1½ or 2 horsepower wash pump will have been pumping, a 200,000 BTUh gas input* or 45 KW* electric rinse booster will have been boosting the primary water to 180°, 10 KW-15KW worth of wash tank heat (or an equivalent amount of gas or steam) will be helping to keep the wash tank at 160°, and the ¼ horsepower exhaust fan on the roof will have removed 36,000 cubic feet of conditioned air from the dishroom.

In a total-electric operation with electricity costing only 5¢ per kilowatt-hour and no demand charge, that hour's worth of continuous* * dishmachine operation might cost 164.5 KWH × .05/kwh or $8.22! This analysis doesn't consider the heat loss from uninsulated water pipes, which is also quite common.

Reprinted from "Washington Watch," published by the National Restaurant Association.

* *Difference results in amount of heating done at primary source vs. secondary (rinse booster) source.* Total *heating required to heat water from 40° to 180° is nearly equal, regardless of where it is heated.*

* * *Most designers and manufactures advise that the machine is in* useful *operation for only 70% of the time, however.*

Some solutions and considerations:

1) Automatic run-time limiter: How often have you entered the dishroom and observed the automatic, rack conveyor machine merrily pumping away without a dishboy anywhere to be found? Although probably not consuming rinse water, other system components such as fan, wash pump, and tank booster are consuming their normal quota of BTU's or KW's. The energy saving, *run-time limiter*, provides a low cost improvement to the existing rack conveyor machine. It interlocks a start switch with the wash pump, exhaust fan, wash and rinse boosters. It is also frequently linked with a rack counter and clean dish table and switch. When properly installed and applied, this device can reduce rack conveyor machine operating time significantly with a resulting savings in energy. It is available from a number of dishmachine manufacturers, national detergent distributors, and independent vendors.

2) Proper machine sizing: One of the inherent disadvantages of the rack conveyor dishmachine is its ability to "overkill." As discussed above, it is possible for such a machine to run when no racks of dishes are being washed. This problem can be controlled or eliminated by the control device installation described above. What is more difficult to control, however, is running less-than-full racks through the machine.

A good solution may be to "take a step backward." Does your operation really need the capacity to wash over 200 racks (probably partially full) of dishes per hour? Would 40, 50 or 80 *full* racks suffice? The door-type "one-armed bandit" machine may be a solution. Its maximum consumption may be only 90-150 gallons of water per hour. Consider it.

"Low-temperature" chemical sanitizing dishmachines: Do they work? Yes. Are they NSF approved? Yes. Any "tricks of the trade?" Yes. Any application restrictions or considerations? Only a few. How do they differ from "high temp" machines? In the method of rinsing the dishes. The wash cycle is essentially the same. They are manufactured in the same basic configurations

as the high-temperature machines: under counter door type; single or double width door type; rack conveyor; rackless (flight) type. The wash and rinse system may vary: batch-type (fill-and-dump) machines; fresh water type with pumped final rinse.

The sanitizing agents are typically iodine-based or chlorine-based. Manufacturers' published capacities range from 1,000 dishes per hour to 18,000 dishes per hour for the largest flight-type machines. Capacity-wise, they are virtually identical to their high-temperature cousins. The chart below illustrates how they save so much energy (rack conveyor example). Note that although NSF requires that only 120° F be maintained for proper sanitizing in the wash and rinse sides of the low temperature machines, our analysis will use 140°F to be conservative. Both the detergent and dishmachine manufacturers recommend maintaining a minimum temperature of 140°F in both wash and rinse to more efficiently strip animal fats from the dishes and to enhance their air-drying. (Compare this chart with the high temperature machine chart below.)

At the same 5¢ per kilowatt-hour rate and no demand charge, the low-temperature rack conveyor machine in this example would cost 55 kwh × 0.05/kwh or $2.75 to operate continuously* * for one hour. For every hour's operation of the low temp machine, you might save $5.47! Not bad!

Application considerations, myths, facts and cautions

1) Myth: Dishes don't dry as well in a low-temp machine. Fact: Most of the heat is placed into the dish during the 140° wash. This doesn't differ between high and low-temp machines. The 180° rinse actually adds very little heat to aid drying. *Fact*: Most drying problems are caused by excessive relative humidity in the dishroom. Be sure to maintain adequate ventilation even when using the low-temp machine. 140° water is still pretty hot and humid!

2) Fact: Precise control of wash and rinse temperature is important. Temperatures below 130°F will not effectively remove animal fat from dishes; temperatures above 150°F tend to drive the chlorine sanitizer out of solution. Best bet is to attempt to maintain 140°F.

3) Myth: Low-temp machines increase chemical costs. *Fact*: Because of the reduced water flow less detergent *may* be used. The cost of the chemical sanitizer is low. (How much does a gallon of chlorine bleach cost?)

4) Caution: The common chemical sanitizing agents, iodine and chlorine, can attack or discolor certain metals such as silver, aluminum or pewter.

5) Caution: If you are considering converting an existing high temp machine to low temp operation (kits are available), the rinse chemicals might attack the pump or other internal components. Such a conversion might also cost your machine its NSF certification. Beware!

Additional comments

- Fill and dump (batch type) machines have one set of pumps, nozzles, controls, etc. This generally means fewer things to go wrong.
- Fresh water type is more complex, but more productive. More tolerant of misuse.
- Although NSF standard requires 50 ppm chlorine at 120°F, 130°-140° is really required to strip animal fat from dishes.
- Recommended temperatures for *best* washability:

  Prewash.....130°F
  Wash.....140°F
  Rinse.....140°F

- Fill and dump (batch type) machines cannot be used with water hardness over 3 grains. The minerals never leave the system; it is impossible to add sufficient chemical concentration to overcome this condition.
- Good pre-scrapping is absolutely necessary with batch-type machines.
- Water consumption of high temperature, fresh water (nonpumped) rinse machines increases as the *flow pressure* increases. Higher pressure=higher flow=higher cost. Water pressure may be so high, in fact, that the hot rinse water actually vaporizes before reaching the dishes! Solution: Install a pressure regulating valve and maintain 15 to 20 psi rinse flow pressure.
- Another benefit: Since low temp machines use *pumped* final rinse, they do not depend on line water pressure to achieve satisfactory rinsing.
- Without adequate training, procedures, and maintenance, no machine will function properly! Management must constantly monitor and control dishroom operations!

High-temp energy summary for one hour's operation

	BTUh Gas Input	Equivalent Nom. KW
Heat 420 gallons of water from 40°F to 160°F (wash)	525,000	125.0
Heat 420 gallons of water from 160° to 180° (rinse)	87,500*	20.*
Operate 15 KW booster at 50%	-	7.5
Run 1/4 hp exhaust fan	-	0.5
Heat 36,000 cubic feet of air from20°F to 70°F	40,000	10.0
Total KW for one hour		164.5 KW

Low-temp energy summary for one hour's operation

	BTUh Gas Input	Equivalent Nom. KW
Heat 144 gallons of water from 40° to 140°F (wash and rinse)	150,000	35.0
Run 2 hp pre-wash pump for 1 hour	-	2.0
Run 2 hp wash pump for 1 hour	-	2.0
Run ½ hp rinse pump(s) for 1 hour	-	0.5
Operate 10 KW booster at 50%		5.0
Run 1/4 hp exhaust fan		0.5
Heat 36,000 cubic feet of air from 20°F to 70°F	40,000	10.5
Total KW for one hour		55 KW

A Bacteriological Survey of Water Slides

WILLIAM L. ST. GEMME

Supervisor, Environmental Sanitation, District #5 Health Office.
Missouri Division of Health, P.O. Box 777, Springfield, Missouri 65801

"The likelihood of the transmission through the water slide of a variety of skin diseases, both bacterial and fungal, was acknowledged by all officials, particularly if appropriate control measures for the slides were not formulated."

Water slides are a relatively new recreational attraction. Their design and utilization are unique, and can pose a variety of problems, such as skin-related diseases, when they are not properly maintained and operated. In this study, several factors became apparent, such as a lack of knowledge as to how to provide adequate bacteriologically and chemically safe water, adequate filtration, and a design which would provide maximum safety protection. Other factors of concern were how to test the various components of these slides, what design criteria to accept, and what the required rate of filtration and level of free chlorine should be. Answers to some of the problems have been attained, but the need for further testing and study is apparent.

Water slides are a recreational attraction, of recent popularity. They've mushroomed and, apparently, will continue to do so. For example, 5 separate water slide operations were known to exist in southwest Missouri in 1977. In 1978, the number increased to 15. Since then, 5 others have been built or are in the planning stage. One can assume that additional facilities are being built throughout the nation. In addition to the new water slide facilities being built, ideas are being suggested for similar recreational devices, which, although related to swimming pools, present totally new and unique areas of concern. Water quality control, both chemical and bacteriological, and the safety of the consumer's health are among these new concerns. Examples of these new recreational features are bumper boat rides, inner tube rides, and wave pools.

This paper was presented at the First Annual Educational Conference of the Missouri Milk, Food and Environmental Health Association, March, 1979.

Through observation of water slide operation and use one immediately draws one conclusion — this facility is a full-body, water-contact bathing attraction, just as a swimming pool is. Water slides, however, are unique in their basic construction and use. A swimming pool is essentially a tank in which the water is continuously pumped from the tank, filtered, treated chemically, and returned to the tank. A swimming pool, compared to a water slide, is really a stagnant body of water, and the controls of such variables as clarity, pH, and free chlorine are relatively simple. A water slide, on the other hand, normally utilizes 2 separate pools of varying sizes and configurations. One pool at the top, is rather small and shallow, while the other pool at the bottom, is large and usually at least 3 feet in depth. The additional size and depth of this pool is necessary to catch the patrons and halt their momentum.

These 2 pools are connected by a flume of varying length, configuration, width, and slope. Some flumes are designed so the "ride" is slow and gentle (due to a low slope), with large gentle turns. Other flumes are designed to provide a very fast and exciting ride by being steep, with sharp, tight turns and many changes in direction. People enter the top pool and slide down the flume to the bottom pool.

Most flumes are constructed of concrete, and a polyfoam pad is used by patrons to slide down the flume. Pads are approximately 2 feet by 4 feet by ½ inch. They are flexible and of either open-cell or closed-cell construction.

The water in the entire slide is continuously moving and, particularly in the flume area, in a thin sheet with high turbulence. This sheet of water will vary from approximately 4"-6" in depth by 1 foot in width at the beginning of the flume to 1" or less in depth by 3 to 4 feet at the end of the flume. This water is violently agitated and aerated while traveling down the flume. This agitation and aeration is most prominent at each turn of the flume, where the water is spread into a rolling, thin sheet up and down the side of the flume. One can most readily assume that this turbulence is increased whenever people and mats are added to the flume. Thus, this situation presents a extremely difficult condition for maintenance of an adequate level of free chlorine.

In July, 1977, a case of impetigo was reported as having been contracted at a particular water slide. This report prompted a cursory investigation of various water slide operations, which revealed apparent gross inadequacies in maintenance both from a bacteriological and a chemical standpoint. During these investigations, most operations were *not* maintaining chlorine residuals, pH levels were extremely high, and the bacterial quality of the water ranged, in most cases, from 200 staph colonies to Too Numerous to Count (this latter result being most prevalent) per 100 ml sample.

These preliminary determinations prompted extensive discussions with various public health officials. The likelihood of the transmission through the water slide of a variety of skin diseases, both bacterial and fungal, was acknowledged by all officials, particularly if appropriate control measures for the slides were not formulated. Ensuing discussions with members of the medical profession produced a concurring opinion that an increase of skin disease occurrence existed during the summer of 1977, and was associated with the use of water slides.

Such potential health hazards prompted a study of water slides. The investigation included: a continuous monitoring of the water quality, an indepth bacteriological study of the polyfoam pads, and an epidemiological facet. The bacteriological study of the pads was of primary concern because of the close personal contact with these pads. Under present operating conditions, none of the water slides were providing any form of sanitization of the pads between bather use. Therefore, the assumption that bacterial or fungal skin diseases could be transmitted was readily apparent.

The use of Rodac plates with specific agar was deemed the most feasible and desirable test method. Advantages were that plates could be prepared in advance; stress of the bacteria would be minimized because of nutrients in the agar; and incubation of plates could start immediately after tests were made. This last reason was important because of the widely separated locations of the slides.

The preplated Rodac plates were taken into the field, and a representative number of pads were sampled, the plates were then placed in a cooler. Other samples and information were then obtained from the slide, and the sanitarian then proceeded to the next facility. By placing the Rodac plates in the cooler, reproduction of the bacteria or fungal growth was retarded. Thus, over-growth on the plates, with false colony counts being reported, was reduced.

The testing program involved sampling 10% of the pads in use at the time of the visit or a minimum of 5 pads per slide; obtaining 3 samples per pad; testing 12 slides (the Springfield-Greene County, MO, Health Department would test the 3 slides in their vicinity, for example); the test period ran a minimum of 8 weeks, with sampling conducted once a week on alternating days. Therefore, approximately 1,500 Rodac plates were required. The type of media to be used were:

a. Sabouraud's for fungi
b. Enterococci for *Streptococcus faecalis*
c. Staph 110 for *Staphylococcus*

"Under the present operating conditions, none of the water slides were providing any form of sanitization of the pads between bather use. Therefore, the assumption that bacterial or fungal diseases could be transmitted was readily apparent."

aureus

Some 150 mat samples were obtained from the various water slides in the southwest Missouri area. These samples were obtained at varying times of the day, anywhere from 10 a.m. to 10 p.m. Attempts were made to sample each slide at different times to attain a variation in weather conditions, such as sunlight and temperature, and the number of patrons utilizing the slide. The actual test period was 4 weeks, instead of the proposed 8 weeks.

The statistical analyses of this sampling program have been limited to the data obtained from the Rodac plates that were selective for staphylococci, since a standard for these organisms exists for swimming pools. The use of the other media was primarily for additional information, according to the microbial population of the water.

For purposes of statistical analysis, the laboratory results were placed in 3 groupings, based upon bacterial counts from mats which had been subjected to 3 levels of chlorine; $\leqslant 1$ ppm, < 2 ppm, $\geqslant 2$ ppm.

Because of the wide variation in bacterial counts in all 3 groups, statistical analyses on arithmetic values, while showing definite correlation, did give standard deviations rendering a probability forecast which was somewhat suspect. Since this problem is not unusual when dealing with bacterial counts, it was obvious that the high and low values would need compression. This was accomplished by converting the arithmetic values to their respective log values and proceeding with the data analysis. The following table shows the mean log value for the respective chlorine group:

Table 1

$\leqslant 1$ ppm	< 2 ppm	$\geqslant 2$ ppm
1.406	1.263	0.952

The preceding table shows a log decrease of .143 from $\leqslant 1$ ppm to < 2 ppm. A decrease of .311 from < 2 ppm to $\geqslant 2$ ppm and an overall decrease of .454 from $\leqslant 1$ ppm to $\geqslant 2$ ppm. This amounts to an overall decrease of 32.3%.

In order to predict a given expected level of organisms in any of the chlorine groups, the Z score was computed and then programmed into a Normal Probability equation. It was decided that the Z score would be computed at a level of 100 organisms (Log 2.000), per Rodac plate. The following table gives the Z score for Log 2.000 organisms and the resulting probability (Pz), in each chlorine range.

Table 2

$\leqslant 1$ ppm	< 2 ppm	$\geqslant 2$ ppm
Z = 0.724	Z = 0.886	Z = 1.332
*P(z) = 0.765	*P(z) = 0.812	*P(z) = 0.909

*In this case P(z) equals a log value from negative infinity to + 2.000.

From Table 2, we can see that the statistical model predicts that the probability of a count being less than 100 or Log 2.000 organisms at $\leqslant 1$ ppm, would be 76.5%, for < 2 ppm, 81.2%, and $\geqslant 2$ ppm for 90.0%.

Conversely, it could be said that the probability of a count exceeding 100 or Log 2.000 at a level of $\leqslant 1$ ppm would be 23.5%, at < 2 ppm = 18.8%, and $\geqslant 2$ ppm = 9.1%.

The foregoing data clearly demonstrate that the staph organisms on the mats are dose responsive to the chlorine content of the water. Thus, if a level of 100 staph organisms or less, 90% of the time, is an acceptable population, then the 2 ppm free chlorine level could be said to be the minimum level necessary to be maintained for a relatively safe operation.

However, if we apply the current Missouri swimming pool standard of 50 (Log 1.699) staph organisms per 100 ml water sample to the Rodac plate count, at the $\geqslant 2$ ppm Cl_2 level, the Z score is 0.946, with a P(z) factor of 0.828. Therefore, the probability that the staph count would be 50 or less would be only 82.8%; or, conversely, the probability that the staph count would exceed 50 would be 17.2%.

Although the dose response of the 3 groups of chlorine level bear a somewhat linear relationship, it should not be assumed that this relationship continues much beyond 2 ppm Cl_2. Thus, as the chlorine content goes beyond 2 ppm, there is a good possibility that a greater ratio of organisms will be killed with each increment increase of chlorine than were killed below 2 ppm.

The results of this study indicate that chlorination of water slides is necessary to maintain a sanitary recreational facility. The level of free chlorine which must be maintained is at least 2 ppm. An early supposition was that the mats could essentially be sanitized while in use, if an adequate level of free chlorine were maintained. The foregoing test results indicate this assumption to have validity. The need for additional facilities, such as a tank or vat containing a strong sanitizing solution, in which to store, sanitize, and rotate the mats between bather use, is not deemed necessary at this time.

A continuation of this sampling program is deemed necessary, in an effort to determine what the optimum free chlorine level might be. Also, such surveillance is necessary to 1) continue to collect data, and 2) to provide a means of safeguarding the public.

Dairy and Food Sanitation

The new IAMFES magazine, *Dairy and Food Sanitation* addresses many of the same concerns as does the *Journal of Food Protection. Dairy and Food Sanitation*, however, provides articles of immediate interest and application to the work of the practicing sanitarian, fieldman, and quality control person.

As such, it complements the scientific *Journal of Food Protection,* which continues to offer the latest research in milk and food sanitation and technology.

In addition to articles, *Dairy and Food Sanitation* contains departments formerly included in the *Journal*, but they're expanded in the new magazine to offer readers more complete information about news, events, and others in the field. Among the expanded departments are news about IAMFES affiliate members, meetings, and events; Association events; new product news; excerpts from such publications as the Center for Disease Control's "Morbidity and Mortality Weekly Report," and the Federal Register. New 3A and E-3A Sanitary Standards and amendments to existing standards are also included in *Dairy and Food Sanitation.*

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PLEASE PRINT

IS COOLING OF MILK OVEREMPHASIZED?

C. K. JOHNS
Stittsville, Ontario, Canada

"With the general adoption of farm bulk tanks, milk is usually cooled quickly to a lower temperature than was customary with can cooling."

As people come to realize there is an energy crisis facing us, there is growing interest in saving energy. One place where such a saving is possible is in the cooling of raw milk on the farm.

It has always been taken for granted that milk must be cooled as quickly as possible to as low a temperature as is feasible in order to inhibit bacterial growth. With the general adoption of farm bulk tanks, milk is usually cooled quickly to a lower temperature than was customary with can cooling. Unfortunately, in many cases this deeper cooling has been substituted for cleaning. It has inhibited the growth of the milk-souring bacteria, leaving the field clear for the organisms able to grow at refrigerator temperature, the psychrotrophs. With the much greater age of most milk when pasteurized, these organisms are able to grow to large numbers, some of which do not show up when plates are incubated at 32C for 48h, as in the current Standard Plate Count.

Back in 1930, when seeking to improve the usefulness of the Methylene Blue Reduction Test, the author found that Preliminary Incubation (PI) at 55F for 18h made it possible to detect milks produced under insanitary conditions which without PI were classed as First Grade (1). Later studies proved that with properly cleaned and sanitized equipment, it was easy to produce milk which gave counts consistently under 10,000/ml *even after PI*! Yet when a sample with an SPC of 10,000/ml before PI 'blew up' to 1,800,000/ml after PI, it is obvious that cooling *has* been substituted for cleaning (2). Further evidence of the secondary importance of cooling was obtained in 1962. Visits to dairy quality control people in Denmark and Scotland revealed records of producers who lacked mechanical refrigeration, with plate counts at 30C for 72h consistently under 10,000/ml. This was done with minimum equipment on small farms, with only water cooling. When asked how this could be possible, the answer was "They know how to clean their equipment". More recently a report from the National Dairy Laboratory in New Zealand (3) showed results of over 2,000 samples of manufacturing milk received at two large factories during 1977-78. One factory had 46% of counts at 30C for 72h under 20,000 m/1, and 82% under 100,000/ml; the other had 39% under 20,000/ml and 77% under 100,000/ml. That there was little difference in quality between water-cooled (59-64F) and refrigerated (38-46F) milk strongly suggests that New Zealand producers of manufacturing milk do a good job of keeping bacteria out of their milk without relying on deep cooling. And in New Zealand milk tankers are not insulated, even for fluid milk! This gives us some idea of what we have to compete with in producing high grade dairy products.

Still further evidence of the overwhelming importance of thorough cleaning and sanitizing comes from a plant in California where, motivated by a quality bonus plan employing PI, two-thirds of the monthly SPCs on raw milk samples were under 3,000/ml *even after PI*!

What has appeared above is proof that high quality milk *can* be produced without deep refrigeration by putting more emphasis on cleaning and sanitizing. By so doing, considerable energy can be saved while improving the quality of the milk.

REFERENCES

1. Johns, C. K. 1930. A modification of the methylene blue reduction test and its comparative value in estimating keeping quality. Sci. Agr. 11:4.
2. Johns, C. K. 1960. Appraisal of methods for assessing the sanitary quality of milk. Publ. 1084, Canada Dept. of Agric. Ottawa.
3. Twomey, A. Personal communication, Jan. 31, 1979.

Quality of Juice Drinks*

LESTER HANKIN[1], DONALD SHIELDS[2] and J. GORDON HANNA[1]

Fruit juice drinks, the non-carbonated variety, are a popular beverage in the US. A quality test was run on these products in Connecticut. Study findings showed the products to be of acceptable microbiological quality, with preservative use more common than label claims would indicate, although not higher than is acceptable for such products. Twenty-one percent of the samples failed to meet Connecticut guidelines for required juice content of their product classification.

During warm weather, particularly, but at all times, non-carbonated fruit juice drinks are popular with all ages of consumers. Marketing approaches for fruit drinks are varied. Refrigerated cases in food stores offer a variety of flavors in many sizes, ranging from half-pint single-serving sizes to full gallon containers. Vending machines dispense small containers of the juice drinks. Juice drinks as well as iced tea are bottled and distributed by milk and dairy products bottlers.

These non-carbonated juice drinks fall into several categories---juice drinks, -ades, drinks and punch, flavored drinks and artificially-flavored products. Label names which fit each category are: orange juice drink, orange-ade, orange drink, orange flavored drink, and artificially-flavored orange drink.

Because juice drinks are so popular and so widely sold, they were tested for quality. In Connecticut, where the test was conducted, the amount of fruit juice products in each category must contain is set by guidelines of the Connecticut Department of Consumer Protection. Juice drinks must contain at least 30% juice; -ades, except lemon and lime, must contain at least 15% juice; lemon- and lime-ades must contain at least 12.3% juice; drinks and punches, except lemon and lime, must contain at least 10% juice; lemon and lime drinks must contain at least 6% juice; and flavored drinks may contain less than 10% juice and artificially-flavored products are not required to contain any juice.

As more water is added to juice, juice concentrates or powdered mixes to make drinks, -ades, punches and other products, additives---artificial and natural flavors and colors---may be added to enhance flavor and aesthetic appeal. In many cases a preservative, benzoate, is added to retard bacterial growth or sorbate, to retard fungal growth and enhance keeping quality.

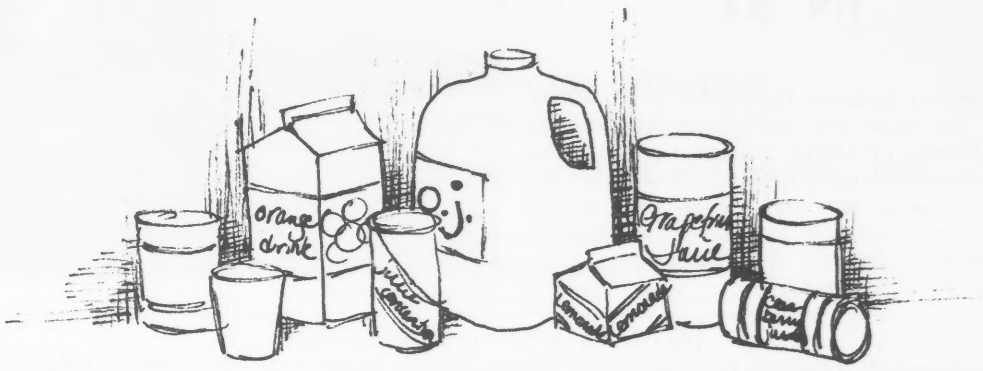
In the present study, non-carbonated juice drinks, including some iced tea, were analyzed for yeast, mold, and bacterial contamination, for acidity and content of juice, preservatives, carbohydrates and calories. The study was conducted in a manner similar to tests of yogurt quality, published in a previous issue of *Dairy and Food Sanitation.*

Test samples were collected during June through August, 1980, at food stores or dairy plants, and placed on ice for delivery to the laboratory. Seventy-four samples representing 27 brands were examined, and four samples of iced tea were included. Only products found in refrigerated cases were taken for analysis; unrefrigerated and canned products were not examined.

All analyses were performed in the laboratories of the Connecticut Agricultural Experiment Station in New Haven. Carbohydrates, juice content, calories, vitamin C, and acidity were determined by methods described by the Association of Official Analytical Chemists (3). Preservatives, caffeine and saccharine were determined by high - pressure liquid - chromatography (4). Microbial analyses were performed using methods in Recommended Methods for the Microbial Examination of Foods (2).

The 74 drink samples included 21 fruit punch, 18 orange, 16 lemon or lemonade, 8 grape, 3 lemon-lime,

[1]*Connecticut Agricultural Experiment Station, New Haven*
[2]*Dairy Division, Connecticut Department of Agriculture, Hartford.*
* *This article adapted from Bulletin 790 of the Connecticut Agricultural Experiment Station, Box 1106, New Haven, CT. 06504; available on request.*



and one each of black cherry, apple, citrus, and orange-pineapple, as well as the four iced teas. Two samples were labeled as diet products. Fifty-nine samples declared use of artificial color; eight declared artificial flavor.

Labels on 33 samples declared addition of sodium benzoate and 14 declared potassium sorbate. For all samples declaring benzoate, the amount found was less than that claimed. The same was true for samples claiming addition of sorbate. Benzoate was found above a trace level in 31 of the 41 samples that did not delcare it. Sorbate was found in 10 samples that did not declare its use.

Ten labels declared that the product was fortified with vitamin C, ascorbic acid. These 10 were the only ones tested for vitamin C content and 5 met the claim.

Yeast contamination greater than 10 yeast/ml was found in six samples. Less than 10/ml is considered insignificant. No samples contained coliform bacteria, indicating good packaging of samples which did not contain benzoate. Mold contamination was minimal; not more than 5/ml was found in any sample.

Bacterial contamination of more than 10 colony-forming units per ml was found in only 11 samples. Eight of these samples did not declare benzoate on the label.

The percent acidity expressed as citric acid indicates tartness. The average acidity of all samples was 0.34%. Lemonades and lemon-flavored drinks averaged 0.54% acidity, while fruit punches and fruit punch flavored drinks averaged only 0.29%.

Carbohydrate or total sugars, except for diet products, ranged from 12.1 to 34.2 grams per 227 ml (8 ounces). Except for diet products, the number of calories per 227 ml ranged from 65 to 127. Calories were calculated as if all were from carbohydrates.

Fifteen of the 70 juice drinks, or about a fifth, did not contain the amount of juice required for their product classification, according to state guidelines.

In most cases, juices examined were found to be of acceptable microbial quality. This suggests that where a preservative was used, microorganisms were controlled. Where a preservative was not used and the microbial quality was satisfactory, good manufacturing practices were indicated.

Where benzoate was declared, the amount of preservative was below the amount claimed. Benzoate was detected in 73% of the samples where it was not declared. Further, sorbate was detected in 13.5% of the samples not declaring it. The amount of sorbate and benzoate in these samples, however, was not higher than recommended for juice drinks.

The amount of carbohydrate in the juice products varied, which means the calorie count for the products varied. This gives the consumer quite a bit of choice of juice products, if calorie content is important in that choice.

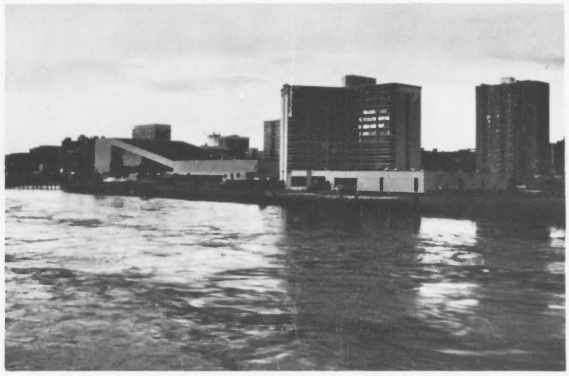
Twenty-one percent of the samples failed to meet Connecticut guidelines for required juice content.

Although not all available brands and flavors were tested, enough were examined to provide an overview of the products available in at least one part of the country.

REFERENCES

1. Hankin, L., and D. Shields, 1980. Quality of Yogurt. The Connecticut Agricultural Experiment Station Bulletin No. 785. New Haven, CT.
2. Recommended Methods for the Microbiological Examination of Foods. 1966, 2nd ed., J. M. Sharf, ed., American Public Health Assoc., New York, NY.
3. Official Methods of Analysis. 1975, 12th ed., W. Horwitz, ed., Assoc. Official Analytical Chemists, Washington, DC.
4. Schuster, R., and K. Wessely. 1977. HPLC-Analysis of Food Additives. I. Preservatives. Hewlett-Packard Application Note AN 232-4.

SPOKANE'S THE ONE IN '81



Welcome to Spokane, the capital of the Inland Empire. We hope that you'll come to the 68th Annual Meeting of IAMFES, August 9-13, 1981 at the Sheraton-Spokane Hotel, Spokane, WA. During the meeting a variety of events are planned, ranging from an ice cream social to a Salmon Barbeque at Riverfront Park, site of the 1974 World's Fair.
We'll see you in Spokane!

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Advance Registration Form for the 68th Annual Meeting, August 9-13, 1981, Spokane, WA

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Salmon Barbeque	6.00	6.00	6.00	6.00
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Salmon Barbeque	7.50	7.50	7.50	7.50	7.50
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PROGRAM

Sixty-Eighth Annual Meeting
International Association of
Milk, Food and Environmental Sanitarians, Inc.

In cooperation with the
Washington Milk Sanitarians Association
August 9 - 13, 1981

Sheraton-Spokane Hotel **Spokane, Washington**

REGISTRATION

Sunday, August 9 - 1:00 PM - 5:00 PM
Monday, August 10 - 8:00 AM - 5:00 PM
Tuesday, August 11 - 8:00 AM - 5:00 PM
Wednesday, August 12 - 8:00 AM - 5:00 PM
Thursday, August 13 - 8:00 AM - 12:00 Noon

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Cecil White	Tennessee
Ranzell Nickelson	Texas
Edith Mazurek	Texas, North
W. J. Farley	Virginia
Lloyd Luedecke	Washington
Don Raffel	Wisconsin

SUNDAY - AUGUST 9

1:00-5:00 PM	Registration-Foyer
1:30-5:00 PM	Executive Board Meeting-Board Room
1:30-5:00 PM	Council of State Sanitarians Registration Agencies-Riverside Room
6:00-7:00 PM	Early Bird Reception-South Room A & B
9:00-11:00 PM	Executive Board Meeting-Board Room

MONDAY - AUGUST 10

8:00 AM-5:00 PM	Registration-Foyer
8:00 AM-5:00 PM	Executive Board Meeting-Board Room
8:00 AM-5:00 PM	Spouses' Hospitality - Inner Circle
8:00 AM-5:00 PM	Food Equipment/Sanitary Standards Committee - South Room C
8:30 AM-5:00 PM	Farm Methods Committee-South Room A
8:30 AM-5:00 PM	Committee on Communicable Disease Affecting Man-Division Room
8:30 AM-Noon	Journal Management Committee-Mountain Room

MONDAY - AUGUST 10

Afternoon

2:00-5:00 PM	Council of Affiliates-South Room B
1:30-5:00 PM	Milking Machine Manufacturers-Sprague
1:30-5:00 PM	National Conference on Interstate Milk Shipments-Monroe
1:30-5:00 PM	Applied Laboratory Methods Committee-3-Mountain Room
1:30-5:00 PM	Council of State Sanitarians Registration Agencies-Riverside Room
1:30-5:00 PM	Dairy and Food Sanitation Committee-Club Car Room
3:30-5:30 PM	Sanitarians Joint Council-Palouse

TUESDAY - AUGUST 11

Morning - General Session - North Room
Harry Haverland, Presiding

8:30 AM	DOOR PRIZE
8:35 AM	INVOCATION-James S. Rettig
8:40 AM	ADDRESS OF WELCOME-Ron Bair
9:00 AM	PRESIDENTIAL ADDRESS-William Arledge
9:30 AM	EFFECTS OF MT. ST. HELEN'S FALL-OUT ON FOOD SUPPLY-James Barron
10:00 AM	MILK BREAK
10:15 AM	DOOR PRIZE
10:20 AM	ANNUAL BUSINESS MEETING-William Arledge

1. Report of Executive Secretary
2. Report of Secretary-Treasurer
3. Committee Reports
4. 3-A Symbol Council Report
5. Report of Resolution Committee
6. Report of Affiliate Council
7. Old Business
8. New Business
9. Election of Officers

TUESDAY - AUGUST 11

Afternoon - Food Sanitation - Center Room
A. Larry Branen, Presiding

1:25 PM	DOOR PRIZE
1:30 PM	FOOD ESTABLISHMENT INSPECTION AND THE COMPUTER-Carrol Farmer

2:00 PM EFFECT OF POTASSIUM SORBATE ON THE GROWTH OF *YERSINIA ENTEROCOLITICA* IN VACUUM PACKAGED PORK-B. R. Myers
2:20 PM FUTURE OF SINGLE SERVICE-Charles Felix
2:50 PM QUANTIFICATION AND IDENTIFICATION OF DIETARY FIBER COMPONENTS IN PINTO DRY BEANS-A. R. McCurdy
3:10 PM BREAK
3:25 PM DOOR PRIZE
3:30 PM WHAT TO DO WHEN A FOOD FADDIST COMES TO TOWN-Mary Rowland
4:00 PM QUALITY ASPECTS OF VACUUM PACKAGED MEATS-H. D. Naumann
4:45 PM AFFILIATE COUNCIL MEETING-South Room B
5:30-7:00 PM WINE AND CHEESE PARTY-North Room
7:00-9:00 PM CRACKER BARREL SESSION-FOOD SANITATION-South Room C
Archie Hurst, Presiding
1. Selection of Equipment for the Food Service Industry-William Manahan
2. Cooling and Refrigeration-D. L. Lancaster

TUESDAY - AUGUST 11
Afternoon - Milk Sanitation - North Room
Robert Marshall, Presiding

1:25 PM DOOR PRIZE
1:30 PM *BACILLUS STEAROTHERMOPHILUS* ASSAY FOR PENICILLINS IN MILK-Roy Ginn
2:00 PM SURVEY OF RAW MILK QUALITY-E. M. Mikolajcik
2:30 PM NEW METHOD OF HYDROGEN PEROXIDE APPLICATION-Sai Farahnik
2:50 PM BREAK
3:05 PM DOOR PRIZE
3:10 PM FEEDING OF WHEY TO DAIRY CATTLE-Murray Weiks
3:40 PM INFLUENCE OF DRYING PLANT ENVIRONMENT ON SALMONELLAE CONTAMINATION OF DRY MILK PRODUCTS-D. L. Jarl
4:00 PM EXPERIENCES WITH UHT - INDIRECT HEATING, DIRECT HEATING-Paul Jelen
4:45 PM AFFILIATE COUNCIL MEETING-South Room B
5:30-7:00 PM WINE AND CHEESE PARTY-North Room
7:00-9:00 PM CRACKER BARREL SESSION-MILK SANITATION-South Room C
Archie Holliday, Presiding
1. Recent Advances in Cryoscopy-Donald Wiggins
2. Authentic Samples in an Industry Surveillance Program-Charles Morrow
3. Vapor Pressure Osmometer-Wayne Barlow

TUESDAY - AUGUST 11
Afternoon - Topics of Interest - South Room A
A. Richard Brazis, Presiding

1:25 PM DOOR PRIZE
1:30 PM A FOOD POISONING OUTBREAK DUE TO *SALMONELLA MUENSTER*-N. H. Nabbut
1:50 PM ROLE OF RAW MEAT AS A VEHICLE OF ANTIBIOTIC RESISTANT GRAM-NEGATIVE BACTERIA-R. Guay
2:10 PM BEAN AMYLAST INHIBITOR-EFFECT ON STORAGE INSECT PESTS-J. R. Powers
2:30 PM CHEMICAL CHARACTERIZATION OF PRICKLY PEARS PULP, *OPUNTIA FICUS-INDICA*, AND THE MANUFACTURING OF PRICKLY PEARS JAM-W. N. Sawaya
2:50 PM BREAK
3:05 PM DOOR PRIZE
3:10 PM BACTERIOLOGICAL EVALUATION OF ALKALI EXTRACTED PROTEIN FROM POULTRY DEBONING RESIDUES-F. Consolacion
3:30 PM THE BACTERIOLOGICAL MONITORING OF THE RIYADH SEWAGE TREATMENT PLANT-N. H. Nabbut
3:50 PM CONTRIBUTION OF NITRITE TO THE CONTROL OF *CLOSTRIDIUM BOTULINUM* IN LIVER SAUSAGE-A. H. W. Hauschild
4:10 PM ISOLATION OF PECTINOLYTIC *AEROMONAS HYDROPHILA* AND *YERSINIA ENTEROCOLITICA* FROM VACUUM-PACKAGED PORK-B. R. Myers
4:30 PM GROWTH AND COMPOSITIONAL CHANGES DURING THE VARIOUS DEVELOPMENTAL STAGES OF SOME SAUDI ARABIAN DATE CULTIVARS-W. N. Sawaya

WEDNESDAY - AUGUST 12
General Session - North Room & Center Room
William Arledge, Presiding

8:25 AM	DOOR PRIZE
8:30 AM	FOOD SPOILAGE IN THE HOME-Lynn Price
9:00 AM	REMOVING TUBERCULOSIS MEAT FROM THE HUMAN FOOD CHAIN-Tanya Roberts
9:20 AM	IRRADIATION OF FOODS FOR PUBLIC HEALTH PROTECTION-Burt Maxcy
9:50 AM	BREAK
10:05 AM	DOOR PRIZE
10:10 AM	BASIC PRINCIPLES OF WATER ACTIVITY-Henry Leung
10:40 AM	UPDATE ON STANDARD METHODS FOR THE EXAMINATION OF DAIRY PRODUCTS-Ronald Case
11:00 AM	FOOD ADDITIVES-RISKS AND BENEFITS-A. Larry Branen
11:30 AM	HAZARDOUS WASTE DISPOSAL-Kenneth Feigner

WEDNESDAY - AUGUST 12
Afternoon Session - Milk Sanitation - North Room
B. J. Edmundson, Presiding

1:25 PM	DOOR PRIZE
1:30 PM	TRANSIENT LINE VOLTAGE ON HERD HEALTH-Grady Williams
2:00 PM	SIGNIFICANCE OF THE PRESENCE OF BETA LACTAMASES IN MILK-R. Guay
2:20 PM	QUALITY ASSURANCE THROUGH PRE-INCUBATION OF RAW MILK SAMPLES-W. Trobaugh
2:50 PM	BREAK
3:05 PM	DOOR PRIZE
3:10 PM	RAW MILK CONSUMPTION IMPLICATIONS TO HEALTH-John Bruhn
3:40 PM	STANDARDIZING CHEDDAR CHEESE MAKING PHAGE-INSENSITIVE, MULTIPLE-STRAIN STARTERS-R. K. Thunell
4:00 PM	RAPID TEST FOR INHIBITORS IN MILK-Raymond W. Mykleby
4:30 PM	EQUIVALENCY TESTING OF THE WHIRL-PAK BAG CONTAINING SODIUM THIOSULFATE FOR THE COLLECTION OF POTABLE WATER SAMPLES-J. Williams

WEDNESDAY - AUGUST 12
Afternoon Session - Food Sanitation - Center Room
William Roth, Presiding

1:25 PM	DOOR PRIZE
1:30 PM	ROLE OF VENDED FOODS IN THE INSTITUTION-R. Estey
2:00 PM	MICROBIOLOGICAL PROFILE OF NEW CHICKEN PATTIE PRODUCTS-N. A. Cox
2:20 PM	NITROSAMINES IN FOODS-R. A. Scanlan
2:50 PM	MICROBIOLOGICAL QUALITY OF FROZEN CREAM-TYPE PIES SOLD IN CANADA-E. C. D. Todd
3:10 PM	BREAK
3:25 PM	DOOR PRIZE
3:30 PM	REVIEW OF *LIMULUS AMEBOCYTE* LYSATE ASSAY AS A FOOD QUALITY INDEX-E. M. Mikolajcik
4:00 PM	PROGRAM FOR SANITATION IN THE BAKING INDUSTRY-Frank J. Raffaele, Jr.
4:30 PM	INCIDENCE OF *CAMPHYLOBACTER FETUS* SUBSP. *JEJUNI* IN RETAIL FOODS-E. M. Timm

Cynthia Good is not your everyday riding enthusiast.

Cynthia Good was paralyzed in 1961. She is now able to walk with the use of a cane.

She graduated Magna Cum Laude in Business Management and received her M.P.A. in Health Administration. Today, she's logistics manager for the nursing department of the Institute of Rehabilitation Medicine of New York University.

Cynthia takes part in national and international riding competitions and is on the board of directors of two riding foundations, the Winslow and North American. She says, "Developing skills in riding produces an unparalleled sense of accomplishment and independent participation—an environment that allows people to deal with people."

We love the same country.
We care about the same things.
We dream the same dreams.
1981. The International Year Of Disabled Persons.

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News and Events

Iowa Association Meets Jointly with IPHA

The Iowa Association of Milk, Food and Environmental Sanitarians held its annual meeting jointly with the Iowa Public Health Association. Approximately 200 persons attended the meeting, held in Ames.

Tornado disaster planning and emergency coordination were stressed in the joint sessions. Norman Francis, Lincoln, NE, representing the Lancaster Civil Defense Office, stressed the destructive powers of tornados. He discussed survival rules to follow and emphasized three precautions: stay away from the outside walls of buildings; go to the lowest possible level of the building; and make yourself as small a target as possible, always protecting your head.

Dennis Hart of the Iowa Office of Disaster Services outlined the emergency coordination in Iowa. He stressed the importance of being familiar with community emergency services.

A look at dairying in the 80's was the focus of the afternoon milk session. Included on that program were Robert Bradley, University of Wisconsin, "Cleaners and Sanitatizers in the 80's;" Robert W. Wilson, FDA, "Dairying in the 80's;" and Dale Termunde, Babson Bros. Co., "Trends in Dairy Farm Equipment."

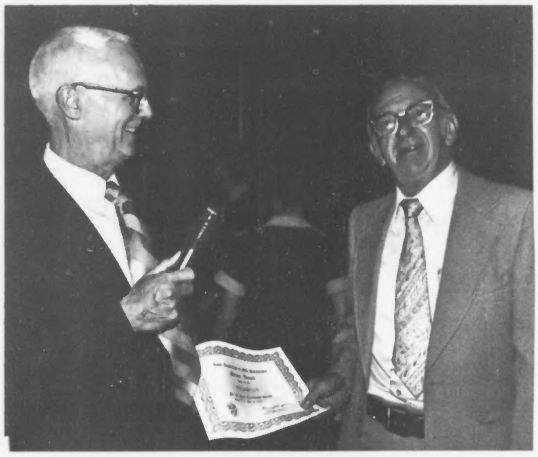
Vending machines and their care and quality provided the central topic for the afternoon food and environmental session. Program participants and their subjects were David Hartley, National Automatic Merchandising Assoc., "Vending Machine Care;" Oscar Honomichael, FDA, "Vending Quality as Seen by the FDA;" and Earl Revell, Iowa Department of Agriculture, "Role of the Sanitarian in the 80's."

Wilbur Nielsen from Independence was presented the Merle Baker Award for outstanding service to the Dairy Industry. A graduate of Iowa State University in dairy industry, Nielsen has worked to improve the dairy industry at all levels. He has been a progressive plant manager using new technology, as it is developed, to help business, industry, consumers, as well as to protect the environment.

Chris Singlestad, Sanitarian for the City of Cedar Rapids, was awarded a 20-year Certificate for outstanding service.

Roy Ormand, Chief of the Dairy Division of the Iowa Dept. of Agriculture, was elected to the Board of Directors.

Other officers of the Association include: President, Clarence Jellings; President-Elect, Gene Peters; First Vice-President, David Peper; Second Vice-President, Roy Ormand; and Secretary-Treasurer, Hale Hansen.



Top, Jim Evers presents a 20-year certificate to Chris Singlestad. Below, Iowa officers include Clarence Jellings, David Peper, Roy Ormand, Hale Hansen, Charles Griffith, and William LaGrange.

HIEFSS to Meet in Houston, Aug. 16-20

The Hospital, Institution & Education Food Service Society (HIEFSS) is preparing for its 21st Annual Meeting which will be held at the Hyatt Regency Houston Hotel in Houston, Texas from August 16 to 20. The Association anticipates an attendance of 1,000 persons. Continuing education clock hours will be granted to Certified Dietetic Assistants and Certified Dietetic Technicians. Clock hours for Registered Dietitians have been requested from The American Dietetic Association.

NRA Show Set for May 16-20

A new feature of the 62nd Annual NRA Restaurant/ Hotel-Motel Show scheduled for May 16-20 in Chicago's McCormick Place will be the NRA Management Clinic. It will offer an in-depth analysis of foodservice and lodging problems.

The entire meeting room complex on the lobby level will be taken over by programs designed to help foodservice/lodging operators improve those management skills that will translate into profits, despite a difficult economy. The three day series of presentations, including several developed in cooperation with the Council of Hotel and Restaurant Trainers, will run from 10:30 AM, Monday, May 18 through noon Wednesday, May 20.

This year the NRA is presenting the largest number of educational programs ever offered at the convention, with an increased emphasis on operators' programs. The educational meetings, to be held in NRA Theatres 1, 2, and 3 on the upper level of McCormick Place, will continue to provide attendees with a wealth of background for increased business know-how.

In addition, exhibitors will show industry trends and developments. Among them:

- Applied Hydroponics promises a "living salad bar" at its '81 booth, introducing a dozen new herb tastes. The "grow and show" fresh herb concept offers edible decor, unique eating and marketing potential.
- The Holman Group, manufacturers of electric food service cooking and equipment, will display three new units: an electric conveyor toaster, an energy efficient unit toasting 720 slices of bread per hour; a high baker with three-inch clearance, ideal for pizzas, submarine sandwiches and french bread; and a finishing oven cheese melter, designed to finish off onion soup and any au gratin dish.
- The National Livestock and Meat Board will highlight its beef steak color guide, a tool to help operators standardize the degree of doneness in steak.
- AMF Wyott, Inc. will feature its new Adjustube II, offering flexibility and convenience in countertop dispensing of plates, cups, bowls, glasses and other round dinnerware.
- American Metalcraft, Inc., -- the country's largest manufacturer of commercial pizza trays, will introduce six new items: a dough retarding pan, two new dough cutters and scrapers, a dough docker, and two sizes of pizza racks.
- Ultra Heat Corp. will exhibit its line of ovens, heaters and bakers with energy efficient quartz elements, designed to save up to 50% the electric power used by conventional heating systems.
- London House Management Consultant, Inc. will feature its new pre-employment screening test that can protect profits by identifying high-risk job applicants. In addition to measuring dishonesty, this new test covers two other critical areas: drug abuse and violent tendencies.
- Libby Glass will display four new larger capacity wine glasses in its Georgian stemware family -- a 6½oz. tall, an 8½oz. round, an 8¼oz. tall and a 6½oz. all-purpose.
- J. M. Smucker's introduces its new 1 oz. single serving packages of preserves and jellies. This larger portion size comes in five varieties, each containing fruit.

Canada Bans PCP's

Canada banned farm, home, and some industrial uses of pentachlorophenols (PCP's) earlier this year after determining an "association between this group of chemicals and possible health and environmental hazards," according to Agriculture Minister Eugene Whelan. He said the action was taken to "ensure that toxic contaminants found in these chlorophenols do not enter the food chain." Wood preservative uses banned were:

> Interior woodwork of farm buildings, feed bins, troughs, silos and stalls; mushroom houses; all wooden food containers; agricultural miticides and disinfectants; vegetation control as an industrial herbicide; interiors of homes; pulp and paper mill slimicides; and spray treatments for home and garden use.

Retained uses were treatment of hydro and telephone poles, railway ties, fences, and others termed "essential" by the Canadian government. (From: P&TCN, Vol. 9, No. 9)

Reprinted from "Kansas Pesticide Newsletter."

HIEFSS Offers Salary and Benefits Survey

The Hospital, Institution & Educational Food Service Society (HIEFSS) has completed its first comprehensive survey of salaries and benefits earned by the Dietetic Assistant. Results were made available in December 1980.

The survey divided the United States into 10 regions and profiled salaries earned and benefits provided by region, giving both the average and median salaries. In addition, the survey provides information on the effect of years of employment in food service on salary, and years in food service and job responsibility. Thus, the profile of the average Dietetic Assistant is a female between the ages of 49 and 59 who has been employed in food service for 11 to 15 years and works in a nursing home as a supervisor of kitchen employees. The survey revealed that salary varies depending on the region of the country, the number of years employed and the degree of job responsibility.

Over half of the Dietetic Assistants and Dietetic Technicians are employed in nursing homes and extended care facilities where they are responsible for the entire operation of the dietary department with guidance from a consultant dietitian. Other DAs and DTs are employed in hospitals, school lunch programs, congregate feeding programs, day care centers, penal institutions, mobile meal programs and restaurants.

Under the HIEFSS certification program, over 85% of the members are Certified Dietetic Assistants (CDA) and Certified Dietetic Technicians (CDT). Their certified status signifies that they are participating in earning continuing education clock hours to keep current in their field.

Copies of the salary survey are available from HIEFSS at a cost of $10.00. Write: HIEFSS, 4410 West Roosevelt Road, Hillside, Illinois 60162.

Irradiation Studied as Food Preservation Method

The USDA is researching the idea that foods can be preserved by irradiation.

Research begun by the Department of the Army on use of irradiation as a means of preserving food was taken over by USDA on October 1, 1980. The studies are now conducted at USDA's Eastern Regional Research Center, Philadelphia.

High-dosage irradiated chicken products are now being studied. If acceptability of irradiated chicken is confirmed, the USDA could request that the FDA approve marketing of the products.

Long-range studies at low-level irradiation will follow the studies of high-dosage irradiation. The goal of low-level irradiation is to reduce marketing losses and to improve the safety and quality of fruits, vegetables, and grains as well as poultry and other meat products.

The research program also includes studies on irradiation as an alternative to using nitrite in preserving meats such as bacon. Nitrite is used to prevent the formation of botulinum toxin, a potentially lethal food poison, but the safety of nitrite itself has been questioned.

Another phase of the program is a study of irradiation for pest control in stored and imported grains and fruits.

Stray Voltage is Focus of NMC Meeting

"Problems with stray current are increasing as the use of electrical energy increases," noted Grady Williams, Washington State University dairy scientist, at the recent NMC annual meeting. He theorized that stray voltage is a problem on about 20% of the nation's dairy farms. He pointed out that cattle can be sensitive to as little as 5 to 15 milliamperes. Williams listed symptoms which may indicate stray voltage--intermittent periods of poor production, unexplained poor performance, incomplete milk letdown, increased milking times, uneasiness of cows in the milk barn, violent cow reactions, refusal of cows to enter stanchions, lapping of water, reduced feed intake, high cell counts, more mastitis, and poor animal health.

"We need to categorize electrical shocks in two fundamental areas, transient voltage and grounding fault voltage," said Joseph Scolaro, Babson Bros. Co. Transient voltage, often referred to as neutral-to-earth voltage could be defined as voltage originating from a source other than the farm in question and may occur sporadically, he explained. Generally, grounding fault voltages are on-farm problems relating to improper or deteriorated grounding of electrical components or fixtures.

Harold Cloud, University of Minnesota agricultural engineer, and Robert Appleman, UM dairy scientist pointed out that the causes of stray voltages are often difficult to locate. They outlined a complete program on tracking down and remedying stray voltage. Robert White, an engineer with Alfa-Laval Limited of Canada, also talked about testing for stray currents.

Reprinted from NMC's "Udder Topics," March, 1981.

Food Service Sanitation Notes

Food Service Sanitation Notes *is written by the National Sanitation Foundation. Write to the NSF with your questions on food service sanitation, problems for which you need answers, or issues you feel should be aired. They'll be included in a future issue of* Dairy and Food Sanitation.

Q. What is the significance of using solid shelving in walk-in refrigeration units?

A. The free circulation of air in refrigeration units is always significant. In walk-in units, the use of solid-type shelves or shelf liners is not normally as problematical as it might be in most reach-in units.

If the refrigeration components of a walk-in are properly sized with abundant fan capacity, the shelves are spaced away from walls, and there is adequate vertical spacing between shelves, the solid shelves in many instances may be desirable.

A configuration of storage to provide for free, unrestricted volume of air flow around the product is the important factor.

Q. NSF has a standard covering supplemental flooring. Is this the type of mats we might find in walk-in refrigerators?

A. NSF Standard No. 52 covers supplemental flooring for use in food preparation, dry storage and warewashing areas. It includes requirements for cleanability, durability and resistance to the use environment, microbiological growth, vermin, slipping and tripping. Supplemental flooring is to be readily removable and not permanently attached to finished floors. Supplemental flooring for walk-in refrigerators and freezers, and carpeting *are not* included in the coverage of this standard.

ADDRESS any problems or questions you wish clarified or answered to:

Food Service Sanitation Notes
National Sanitation Foundation
3475 Plymouth Road
P.O. Box 1468
Ann Arbor, Michigan, U.S.A. 48106

Case Studies in Sanitation

This and future Case Studies in Sanitation *are written by Frank Raffaele, Vice President of Regulatory Compliance, American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.*

Case #8-Bacteria In Frozen Cakes

It was shortly past 7:00 a.m. on the morning of August 6th, 1976, as Corporate Sanitarian Johnny Clark stepped aboard flight 21, non-stop from New York to Denver. Johnny yawned and grumbled as he sank into his seat and reconstructed the events that led to this trip.

For the past six years, Johnny had held his position with the Concord Baking Company, and as Concord expanded he found himself traveling more and more frequently to trouble-shoot sanitation problems in the seven Concord bakeries.

The evening before, Johnny had received a call from his boss who insisted that something had to be done immediately to solve a micro problem that had been festering in the Denver facility for some weeks. So, Johnny reviewed the facts and tried to establish his plan.

Late in June of 1976, the corporate office received a letter from the Denver FDA which stated an intensive microbial survey of Concord's frozen dessert layer cakes had revealed that the products tested consistently ran high total plate counts and several samples were found to contain modest numbers of *E. Coli.*

Since *E. Coli* is considered a fecal indicator organism by the agency, they expressed some concern about operational methods being employed by the plant and even sent a team of three investigators into the facility. They spent four days in the plant and came up with little more than one page of superficial poor personnel practices, having no relation to microbial contamination.

FDA's intervention came as a surprise to Concord executives, although both Denver and the corporate labs had been aware of the problem for some time. The problem as documented was sporadic and could be seen in chocolate layer cake one day, and then one or two coconut varieties the next day.

Extensive laboratory micro analysis indicated that the *E. Coli* was present in either the filling or the icing and sometimes in both. The problem being there was never a set pattern, and all seven varieties were effected.

Even the FDA was frustrated because there are no government standards for frozen dessert cakes but the presence of the indicator organism kept them concerned.

As the plane left New York, Johnny wondered what part he would play because microbiology was definitely not his forte and other corporate personnel had come and gone without solving the problem.

Johnny Clark deplaned in Denver and reluctantly walked up to the car rental counter never realizing that the next five days would culminate in the most productive hours of his career.

The Concord bakery in Denver was a new and modern facility, constructed two years earlier. Both the outside and inside appeared as a showplace of modern bakery technology with new color coordinated, automated equipment, plus an elaborate laboratory.

Virtually all raw materials were subjected to micro analysis prior to their use in production and specifications were very tight and well enforced.

The interior of the facility was mostly constructed of tile and reminded one of a milk plant with Oakes Machines, stainless steel piping, soaking troughs and very elaborate master sanitation schedules for breakdown and sanitizing of equipment pumps and lines.

The dessert cake line was straight and fully automated and the iced cakes traveled directly from packaging into the freezer in minimal time.

Mixing bowls were all sanitized prior to use by high pressure steam in conjunction with a "Quat" sanitizer and immediately covered with a sanitized heavy plastic cover.

All critical ingredients were maintained at 38°F., including whole eggs which were completely thawed in a circulating trough at 43°F. Temperature control was maintained by recording chart units and strictly monitored by Quality Control personnel.

At the end of each production day, all lines and pumps were disassembled, steam cleaned and soaked in a sanitizing solution for a minimum of two hours prior to reassembly.

Conveyors were cleaned with steam and hot water and just prior to start-up, the entire line was sanitized utilizing quaternary ammonia.

After his arrival at the plant, Johnny Clark first checked in with the plant manager to exchange greetings and explain his assignment. He then met with the director of Quality Control and received the latest micro data with lab personnel. That done, Johnny requested the lab make up 50 culture plates consisting of total plate count agar and macconkey agar for future use in swab tests on the lines.

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Case Studies in Sanitation, *con't. from p. 212*

Entering the production room, Johnny and the Quality Control director were careful to thoroughly wash their hands at the stainless sink located at the left side of the entrance. Johnny thoughtfully placed a mark at the soap line on the back of the dispenser to make certain that handwashing was being done by production personnel.

As the two men approached the end of the oven, Johnny stopped next to the stainless tank containing the filling. This tank was constructed with a stainless cover and a small lightening mixer was mounted at the top. Examining the mixer housing carefully, Johnny noted that a screw was missing on one side of the plate which permitted him to manipulate the plate upward, only to discover that the housing was hollow. Removing the plate he discovered stagnant water had accumulated within the hollow void probably as a result of efforts to clean and sanitize the housing. Samples of this water were immediately sent to the lab (the lab would later report the presence of large numbers of bacteria).

The mixers used by Concord for icing and filling were the large vertical type. Later that day, as Johnny observed this mixing procedure, he thought he saw water coming from the mixer head when the machine was first turned on. A close examination revealed the mixer head was hollow and by removing the lubrication plug in the front of the head, more water was discovered.

Laboratory personnel were immediately summoned to culture all the mixing heads and the following day the culture plates revealed TNTC counts from every sample.

Among improvements needed were:

1. Remove the back plates on all lightening mixers and thoroughly remove water from the inner housings prior to startup.
2. Wet cleaning of vertical mixers in this operation must be followed by adequate drying time and the lubrication plug on the mixer head must be removed and stagnant water removed prior to use.

Grizzly Bear Dinner Results in Trichinosis

A dinner of game meats served on December 20, 1980 in Barrow, Alaska resulted in eight cases of trichinosis. The twelve persons who attended the dinner ate "maktak" (whale blubber), "ugruk" (bearded-seal meat, dried and stored in seal oil), fresh raw whitefish and grayling, and "quaq" (raw frozen meat), thought by the diners to be caribou but later discovered to be grizzly bear.

The eight persons who became ill within 2-16 days after eating the meal included five men and three women, ranging in age from 32 to 76 years. All eight patients reported eating quaq, while the remaining four said they had not eaten it. Quaq was the only meat eaten by those who became ill. Thirty other family members who were not at that dinner did not become ill. Signs of the illness included edema, fatigue, myalgia, rash, fever, chills, periorbital edema, headache, visual disturbance, diarrhea, abdominal cramps, nausea, and vomiting. None of the patients had notable pulmonary, neurologic, or cardiac complication. Five were hospitalized and five received steroids, while two received anthelmintic therapy.

The grizzly bear from which the meat came had been shot the previous autumn in the family's summer camp, 140 miles inland from Barrow. Parts had been thoroughly cooked and consumed at the time without adverse effects. The hind quarters and a large quantity of moose and caribou meat were returned to Barrow and stored frozen in the family's cold cellar. None of the bear meat had been eaten in Barrow before the dinner on Dec. 20 and none had been given away. The remains of the hind quarter from the dinner were fed to dogs; the other hind quarter remained in cold storage. A sample of meat taken from the digestive tract of one of the patients contained 70 *Trichinella* larvae per gram of meat.

MMWR editors note that this is the fourth outbreak of trichinosis in Barrow since 1975. Consumption of uncooked walrus led to 29 cases in 1975, and 4 in 1976. One case occurred in 1980 but the source of that one was not identified.

Subsistence living is the standard in Barrow and traditional foods are economically and culturally important there. Many meat dishes feature fresh, fermented, fried, or frozen meats that are eaten raw. Many residents state that they were taught by elders to cook bear meat thoroughly to avoid illness. The North Slope Borough Health and Social Services Agency has worked to reinforce that practice with spot radio and television announcements. The persons involved in this outbreak knew of that practice, but did not believe they were eating bear meat.

Excerpted from *Mobidity and Mortality Weekly Report,* Vol. 30, No. 10, March 20, 1981.

Industrial Waste Dump Sites a Critical Problem

Everyone agrees that there should be safe places for disposing of hazardous industrial wastes. But nobody wants a waste dump in his own town.

That's the dilemma for industry, state governments and the federal Environmental Protection Agency in tackling the hazardous-waste problem. The public wants the problem resolved, but apparently there mightn't be enough safe places to put the estimated 41 million tons of hazardous wastes generated by industry each year.

"Critical Problem"

The EPA calls creation of more facilities "a critical problem" and says "capacity shortages are expected" in New England, much of the Midwest and the Pacific Northwest. Ironically, EPA regulations will exacerbate the problem as enforcers close unsafe settling ponds and landfills at many plants generating the wastes.

Joan Berkowitz, vice president of Arthur D. Little Inc., a research and consulting concern, warns that "enforcement of the EPA regulations may result in a significant switch from on-site to contract disposal." As a result, she says, a four-million-ton-a-year shortage of disposal sites could develop by the end of the decade.

Eileen Clawson, director of the EPA Solid Waste Division's Office of Management Information and Analysis, says the agency believes that there is adequate capacity nationally "but there are a number of regions with problems." She adds, "We would guess that over 90% of the existing facilities won't meet EPA standards."

Solving the site problem is difficult. While it is in the national interest to have plenty of safe, low-priced hazardous-waste facilities, it is clearly against the interest of any single community to accept one. A landfill, a treatment facility or even an incinerator for industrial wastes brings truckloads of hazardous material rolling through town, the threat of lower property values and the looming risk of a disaster, such as that at Love Canal.

Good System Lacking

"The problem is we don't have a good mechanism for deciding what towns should be the ones" that get facilities such as prisons, nuclear plants and hazardous waste facilities, says Michael O'Hare, a Massachusetts Institute of Technology professor working temporarily for the Massachusetts secretary of environmental affairs. Because neighbors of such facilities seldom get much benefit and often lose amenities, "a socially beneficial project can be stalled or blocked permanently on each possible site," O'Hare observed in a magazine article called "Not on My Block You Don't."

Hazardous-waste facilities are particularly difficult to locate. Unlike power plants or refineries, they don't pay huge property taxes because hazardous-waste treatment usually involves a relatively small investment. And they don't provide many jobs as prisons or other institutions do.

Massachusetts is a case in point. Last year, the state surveyed potential sites for hazardous-waste landfills. When the survey listing three prime sites leaked out, legislators from the three towns rapidly pushed through the legislature special bills prohibiting location of such facilities in their towns.

Trying to keep local communities out of the decision-making process doesn't work very well, either. Back in 1977, SCA Services Inc., a Boston-based waste company, built a large secure landfill in the little town of Wilsonville, Ill. The facility, which was made secure with plastic lining to prevent wastes from leaking out into ground water, was considered first-rate by SCA.

Suit Filed

Both the state and federal environmental agencies approved the site for disposal of particularly noxious contaminants such as polychlorinated biphenyls (PCBs), which are suspected carcinogens. But the 700 residents of Wilsonville decided that they didn't want it, and they

"Hazardous-waste facilities are particularly difficult to locate. Unlike power plants or refineries, they don't pay huge property taxes because hazardous-waste treatment usually involves a relatively small investment. And they don't provide many jobs as prisons or other institutions do."

filed suit to close the facility. While the suit dragged through the courts, the local drainage district blocked the sole access to the landfill, by digging up the road, ostensibly to install a culvert, according to an Illinois EPA spokesman. Eventually, a state court ruled that SCA should close the landfill and remove all the wastes buried there. The state and federal EPAs and SCA are appealing the order. "Removal could have a material adverse effect" on corporate finances, SCA says in its annual report.

"From Cradle to Grave"

The 1976 law "makes you responsible from cradle to grave," says Robert Jacobs, manager of waste treatment for Hadco Printed Circuits Inc. in Derry, N.H. Every time a load of waste leaves the plant gate, it must be accompanied by a shipper's manifest. When the load is delivered to an approved facility, the facility must send a copy of the manifest to the waste producer. Thus, the producer can't deny knowledge of where his wastes go. Companies disobeying the law are subject to fines of up to $50,000 a day.

Meanwhile, the EPA and state environmental agencies

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INCUS Changes to USNAC

At a recent meeting in Rosemont, IL, INCUS, the Interim National Committee of the International Dairy Federation (IDF) in the USA, voted to become the United States National Committee of IDF. The International Dairy Federation promotes through international cooperation and consultation, the solution of common scientific, technical and economic problems in the world dairy industry.

To join IDF, a nation's dairy industry must form a National Committee that is representative of its various dairying activities, such as production, manufacture, commerce, technique, science, education and administration. Presently, 31 countries, excluding the US, have IDF National Committees. The US National Committee (USNAC) will become a full member when its dues are paid to IDF.

The interim committee, INCUS, was formed in 1979 to assess the need for a permanent United States National Committee. Its decision to dissolve and form USNAC was based on results of a year-long study by its steering committee of advantages and disadvantages to the US dairy industry of membership in IDF. The steering committee study report and the report of the US delegation to IDF's 64th Annual Sessions in Bristol, England were presented at the INCUS meeting.

The steering committee determined that "there is a need for US dairy industry involvement in the work and activities of the International Dairy Federation" and that "such involvement will not jeopardize the integrity of domestic US dairy policies." It also found that the 43 organizations/individuals who initially supported INCUS activities represent all segments of the US dairy industry, as required by IDF.

After INCUS was disbanded at the meeting, the newly formed USNAC adopted Articles of Incorporation and bylaws and elected a Board of Directors and officers. Officers are:

Fred J. Greiner, Dairy and Food Industries Supply Association, chairman

John W. Sliter, United Dairy Industry Association, vice chairman

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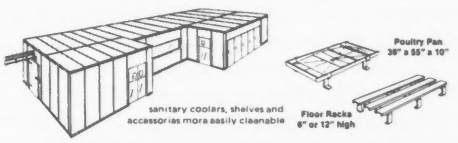

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USDA Defers Final Decision on PCB's

The USDA will defer the final decision on its proposal to ban liquid polychlorinated biphenyls (PCB) from federally-inspected meat, poultry and egg products plants while the impact of a related court decision is studied.

Donald L. Houston, administrator for USDA's Food Safety and Quality Service, said USDA, the Environmental Protection Agency and the Food and Drug Administration last summer proposed banning PCB from electrical equipment used in food manufacturing and storage plants.

"These proposals were based, in part, on existing Environmental Protection Agency regulations," Houston said.

"Last October," said Houston, "the U.S. District Court of Appeals in Washington, D.C., ruled in a suit brought by the Environmental Defense Fund that EPA's existing regulations were in violation of the Toxic Substances Control Act."

"The court said evidence did not support EPA's decision to exclude from regulation all materials with PCB levels below 50 parts per million. EPA is now negotiating the matter with the litigants," he said.

"Since the final resolution of EPA's 50 ppm rule affects FSQS' proposal banning PCB-containing equipment, the agency intends to set its proposal aside until that issue is resolved," Houston said. Both EPA and FDA are taking similar actions on their proposals.

FSQS proposed banning PCB-containing equipment from meat, poultry and egg products plants May 9 last year. The agency first gave the public 60 days to comment on the proposal, but then extended the comment period several times, Houston said.

EPA and FDA announced similar PCB proposals last summer, and they similarly will extend their comment periods and deferred action on the PCB proposal, Houston said.

USDA will not issue a final PCB regulation until another opportunity for officially submitting comments is provided. In the meantime, however, FSQS is still seeking comments. Written comments should be sent to Annie Johnson, FSQS, USDA, room 2637, South Agriculture Bldg., Washington, D.C., 20250.

Cryogenic Refrigeration with CO_2 to be Used in Railcars

Test shipments have shown that cryogenic refrigeration utilizing CO_2 is a feasible alternative to mechanical refrigeration in railcars transporting frozen foods. An Industry Task Force sponsored by the American Frozen Food Institute and the International Association of Refrigerated Warehouses is evaluating alternatives to the aging diesel powered, mechanical refrigerator railcars now in service.

Task Force Chairman, Ralph P. Hill, Vice President, Distribution, Lamb-Weston, Inc., Portland, OR, reports that five successful experimental shipments have been made since last June utilizing a Burlington Northern mechanical refrigerator car modified for cryogenic refrigeration. Four test shipments originated from Termicold Corporation from the state of Washington to the Midwest with carloads of frozen potatoes and frozen peas made by Lamb-Weston and General Foods. The latest test shipment originated from Northwestern Cold Storage in Walla Walla, WA, consigned to Green Giant in Belvidere, IL.

Upon injection through a manifold system in the ceiling of railcar, the liquid CO_2 forms a layer of dry snow which surrounds and prefreezes the load to as low as minus 80° F. Product temperature remained well below 0° F., without mechanical refrigeration, and quality was judged to be excellent after the one week trips. With the continuing cost escalation of diesel fuel, this system will provide an energy efficient method of the future transportation of frozen foods since CO_2 is a by-product of a number of manufacturing processes.

C. W. McCollister, Director Operations for the Western Fruit Express Company, a wholly-owned subsidiary of the Burlington Northern, cites some of the additional advantages as lower car investment costs and greater payloads in larger, heavily insulated refrigerator cars without high-maintenance mechanical refrigeration systems utilizing diesel fuel.

The Task Force, in conjunction with scientists from the USDA's Office of Transportation and the Refrigeration Research Foundation-University of Maryland Laboratory will continue evaluation of cryogenic refrigeration of various frozen food products in railcars during 1981. The second phase of the project will focus on the design and modification of a sixty foot, heavily insulated boxcar for cryogenic application and testing during 1981. This heavily insulated car without mechanical refrigeration will be a prototype for the future high-cube cryogenic refrigerator car which will allow for the loading of fifteen percent to twenty percent more frozen product in a unitized load configuration.

For further information, interested parties should contact Francis G. Williams, American Frozen Food Institute, 1700 Old Meadow Road, McLean, VA 22101. 703-821-0770.

Energy Saving Ideas for Dishwashing, Heating Water

Dishwashing and utensil sanitation are vital for the protection of public health and for the promotion of a foodservice facility's public image. These sanitation processes alone consume about 13 percent of a restaurant's energy budget. Even while maintaining the necessary high standards of sanitation, energy can be saved in water heating and dishwashing.

Energy-saving procedures can be simple or exotic. At least one foodservice operation for example, is experimenting with using rooftop solar collectors. The captured solar energy is used to partially heat water before it enters the water heater, thus significantly reducing the energy expended by the water heating system. Another experimental idea is to use the waste heat from gas fryers to heat dishwashing water.

This checklist shows you how to save both energy and money in your dishwashing and water heating processes without resorting to the exotic methods mentioned above. It is important to remember that very substantial energy and dollar savings can be realized with minimal investment required. Equally important is the continuous nature of these efforts in assuring their effectiveness.

- ——— Turn water heater down to 75° F. on closing, and turn to 140° F. two hours before opening. (Adjust warmup time to fit your needs.)
- ——— Drain water heater every six months for thorough cleaning.
- ——— Shut off electric booster heaters on dishwashers when the kitchen is closed.
- ——— Use hot water only when necessary.
- ——— Do not use dishwashing machine for a small number of soiled dishes. Wait until a full load is available before running.
- ——— Keep heater coils free from lime accumulation.
- ——— When the main dishwashing rush is over, turn off equipment booster heaters and accumulate dishes until the next rush period.
- ——— Dripping hot water faucets are costly in energy use. All leaky faucets should have washers replaced immediately.
- ——— Obtain water pressure regulators for hot water line to dishwasher to reduce wasted hot water. Set regulator to the operating pressure required by the machine.
- ——— Make sure power rinse on dishwasher is turning off automatically when tray has gone through machine.
- ——— Insulate all hot water lines.
- ——— Limit general use hot water to 105° F.
- ——— Cleaning should be done during daylight hours if possible.
- ——— Mop from bucket to conserve hot water use.
- ——— Accumulate trash for full-load burning frequencies, when incinerators are used.

INCUS, *con't. from p. 215*

Harold Wainess, International Association of Milk, Food and Environmental Sanitarians, secretary
Gregory M. Farnham, Dairyland Food Laboratories, Inc., treasurer

Other Board members are:
Ralph Hofstad, Land O'Lakes, Inc.
George Muck, American Dairy Science Association
John H. Nelson, Kraft, Inc.
Robert L. Nissen, Ladish Co., Tri-Clover Division
Ellen M. Spear, Beatrice Foods Co.

The original 43 INCUS supporters, as well as all other members of the US dairy industry, are invited to join the US National Committee of IDF. USNAC bylaws, based on the steering committee report, establish three membership categories. They are: CategoryI--Corporate, includes coporations, cooperatives and associations; Category II--Institutional, includes universities, colleges and departments and agencies of government; and Category III--Individual, includes any individual who is neither represented nor eligible through Categories I and II. Within each category are membership classifications divided by type of privileges and amount of dues.

USNAC will hold its first formal meeting during the first quarter of 1981.

For more information, contact: Harold Wainess, 464 Central Avenue, Room 24, Northfield, IL 60093.

Committee Reports - 1980 Annual Meeting

ANIMAL WASTE MANAGEMENT SUBCOMMITTEE

The subcommittee has compiled guidelines for management of animal wastes from some 25 states to prepare for sanitarians a concise reference index of recommended dairy farm waste management practices.

The index will be updated periodically and made available at the International to IAMFES members and other interested sanitarians.

Laws, regulations and currently recommended practices will be indexed for reference according to the following subject areas:

I. Laws and regulations
   - A. EPA Water Quality Management Program
   - B. Federal - NPDES
   - C. Non-NPDES States

II. Model procedure to avoid conflict between EPA and Health Officials

III. Solid waste management systems -- Best management practice by region

IV. Liquid waste management systems -- Best management practices by region

V. Other waste management systems
   - A. Combination Systems
   - B. Biological Systems
   - C. Above-ground Storage Systems

VI. Land waste management
   - A. Farm
   - B. Urban
   - C. Recycling Guidelines

VII. Refeeding of animal wastes -- research update

VIII. Continuing research projects
   - A. EPA demonstration projects
   - B. Fly and pest control recommendations
   - C. Miscellaneous Research Projects

Subcommittee members:
Lee Lockhart
Hugh Munns
Charles Meach
G. Donald Calhoun
B. Edwin Stout
Lowell Allen [Chairman]

COORDINATION OF MILKING SYSTEM INSTALLATION RECOMMENDATIONS SUBCOMMITTEE

The goal of this committee is to increase and improve communication with regulatory and industry influentials on current trends and proposed changes. Our activities will be as follows:

1. To gather a composite of current states, federal, cooperatives, and industry regulations and recommendations in all types of milking systems.
2. To study and review the guidelines of the composite of current regulations for all states.
3. To study and make recommendations on the cleanability of large milking systems (2½" or larger).
4. To prepare a composite of current recommendations for publication and distribution when approved by the Farm Methods Committee.

To date, information has been gathered from approximately 20 states. We are working toward assembly of the remaining information prior to the meeting in August. At this time the information will be studied and reviewed to be indexed and a composite submitted to the Farm Methods Committee for distribution when approved.

Subcommittee members:
Phil D. Bautz
Paul Lammert
Robert Dawson
Vernon Cupps
Charles Morrow
Helene Uhlman
Gary Trimmer
Robert Ryan
Louis Schultz
Stephen B. Spencer
Charles Price
L. A. Skeate
Raymond L. Appleby [Chairman]

STANDARDIZATION OF PROCEDURES FOR UNIFORM INSPECTION AND RECOMMENDATIONS FOR MASTITIS PREVENTION AND CONTROL SUBCOMMITTEE

The Subcommittee, through its various task groups, is continuing its responsibility concerning uniform procedures and recommendations for mastitis control.

The task group concerned with a seminar training program has completed its work. This seminar is entitled, *Dollars and Sense of Mastitis Control.* It is comprised of 586 color slides, organized into 14 chapters and eight slide sets. Each set will have printed script and tape cassette narrative.

The content of the individual sets is as follows:

Set. 1.		No. Slides	Tape Length (minutes)
Chapter 1.	Introduction	29	11
Chapter 2.	Definitions	30	11
Chapter 3.	Economic Importance	18	8
		77	30

Set 2.			
Chapter 4.	Nature and Development	42	13
Chapter 5.	Detection	34	11
		76	24
Set 3.			
Chapter 6.	Strategy	20	8
Chapter 7.	Hygiene	46	17
		66	25
Set 4.			
Chapter 8.	Milking Equipment	78	23
		78	23
Set 5.			
Chapter 9.	Milking Procedures	71	22
		71	22
Set 6.			
Chapter 10.	Treatment	62	28
		62	28
Set 7.			
Chapter 11.	Specific Infections	37	14
Chapter 12.	Problem Herds	41	17
		78	31
Set 8.			
Chapter 13.	Economic Returns	14	8
Chapter 14.	Summary	64	32
		78	40

The slides, scripts and type will be available through NASCO, Fort Atkinson, WI, in one complete package or by individual sets.

The Fieldman's Hand Book Task Force has decided that an index of publications for the fieldmen would be more helpful than an actual hand book. All of the N.M.C. publications would be indexed, plus many other commercially published references. This index would be made up in an attractive bound copy and hopefully will be available to all industry persons at no charge.

The task group working on Producer Brochures will probably have the first of several ready by the summer meeting. The first brochure will cover improved udder health. These brochures will be available to persons or organizations to be used as check stuffers or direct mailing. No cost is known at this time.

Subcommittee members:

Joseph P. Scolaro
Allan Bringe
Cecil Hickox
William Hastings
Hugh Munns
Archie Holliday
William Trobaugh
W. Nelson Philpot
Leon Townsend
Ken Kirby
Don Rollins
James Reeder [Chairman]

FARM SANITATION CHEMICAL ADVISORY SUBCOMMITTEE

Based on an informal subcommittee meeting in Louisville, KY, we were able to generate a charge for our 1978-1979 work. The charge is to identify and quantify the "do's and don'ts" of farm chemicals relative to product safety considerations.

The classic example of this is, "Don't mix a chlorinated product with acids." Many projects like this have been attempted in the past. Our purpose will not only be to list these hazards but to state why the practice is hazardous and what the results are. Possibly, hazardous categories could be such things as inactivation of a sanitizer or teat dip, skin burns, dangerous reaction products upon addition of one product to another, inactivity due to exposure of chemicals to the weather elements and illegally using a product due to certain federal regulations.

For the sake of simplicity, each member of this subcommittee has been assigned one functional group of products. These assignments are as follows:

Alkaline Pipeline Cleaners	-Roger Gas
Acids, Both Pipeline & Manual	-Richard Page
Manual Cleaners (All types)	-Russ Hellensmith
Teat Dips	-Pete Godfredson
Sanitizers & Udder Washes	-James Jezeski
Miscellaneous Products	-Maynard David

Subcommittee members:

J. P. Godfredson
Russell Hellensmith
Roger Gas
Richard Page
Maynard David
James Jezeski
Dennis Birchard
Joseph Edmondson [Chairman]

EDITORIAL REVIEW SUBCOMMITTEE

This Subcommittee Assignment was created at the 1978 IAMFES annual FMC meeting to review and condense previous Farm Methods Committee Reports into a readily usable reference handout.

Copies of previous reports are being assembled and the initial draft will be presented at the 1980 Farm Methods Committee Meeting.

Subcommittee members:

Ray Belknap
Clarence Luchterhand
Sid Beale
Bendor Luce
Terry Mitchell [Chairman]

Calendar

May 13-15---3A SANITARY STANDARDS COMMITTEE MEETINGS. Galt House, Louisville, KY. Contact: Harold Thompson, DFISA, 5530 Wisconsin Ave., Room 1050, Washington, DC 20015.

May 16-20---61st ANNUAL NATIONAL RESTAURANT SHOW. McCormick Place, Chicago, IL. Contact: NRA Convention Dept., One IBM Plaza, Chicago, IL 60611.

May 18-21---INTERSTATE MILK SHIPPERS CONFERENCE. Hot Springs, AK. Contact: Herb Vaux, Indiana State Board of Health, 1330 W. Michigan St., Indianapolis, IN 46206.

May 27-29---AMERICAN SOCIETY FOR QUALITY CONTROL, 36th Annual Quality Congress San Francisco, CA. Hilton & Tower. ASQC, Dept. PI-1000, 161 W. Wisconsin Ave., Milwaukee, WI 53202.

June 1-4---PENNSYLVANIA DAIRY FIELDMEN'S-LABORATORY DIRECTORS CONFERENCE. Keller Conference Center, The Pennsylvania State University, University Park, PA. Contact: Wallace C. Jackson, RD 2, List Hill Road, Valencia, PA 16059.

June 5-6--INSTITUTE OF FOOD TECHNOLOGISTS' BASIC SYMPOSIUM. Atlanta, GA. Symposium topic: Food Carbohydrates. Contact: Dan E. Weber, Director of Marketing/Administration, Institute of Food Technologists, 221 N. LaSalle St., Chicago, IL 60601.

June 7-10---IFT 81, 41st ANNUAL MEETING AND FOOD EXPO, Institute of Food Technologists. World Congress Center, Atlanta, GA. Contact: IFT, Suite 2120, 221 North LaSalle St., Chicago, IL 60601, 312-783-8424.

June 8-10---AIB/FDA SANITATION AND QUALITY ASSURANCE MANAGERS WORKSHOP. Chicago, IL. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

June 21-24---24th ANNUAL CANADIAN INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY. Theme: "Research: Whose Business?" Winnipeg Convention Centre/ Holiday Inn, Winnipeg, Manitoba, Canada. Contact: Barry McConnell, Conference Chairman, Dept. of Food Science, University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2.

July 13-15---PRINCIPLES OF QUALITY ASSURANCE. Washington, DC. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

August 3-5---PESTICIDE RECERTIFICATION. Manhattan, KS. Sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

Aug. 9-12---IAMFES ANNUAL MEETING. Sheraton-Spokane, Spokane, WA. Contact: IAMFES, PO Box 701, Ames, IA 50010, 515-232-6699.

Aug. 17-21---21st ANNUAL MEETING, HOSPITAL, INSTITUTION & EDUCATIONAL FOOD SERVICE SOCIETY. Houston, TX. Contact: HIEFSS, 4410 West Roosevelt Road, Hillside, IL 60162.

Aug. 30-Sept. 4----WORLD ASSOCIATION OF VETERINARY FOOD HYGIENISTS, Eighth Symposium. Theme: "Animal Health, Food Safety and the Consumer." Dublin, Ireland. Contact: The Secretariat, 8th WAVFH Symposium, 44 Northumberland Road, Ballsbridge, Dublin 4, Republic of Ireland.

Sept. 14-16---PESTICIDE RECERTIFICATION. Chicago, IL. Course sponsored by American Institute of Baking, 1213 Bakers Way, Manhattan, KS 66502.

Sept. 16-18---NEW YORK STATE ASSOCIATION OF MILK AND FOOD SANITARIANS, Annual Conference. Hotel Syracuse, Syracuse, NY. Contact: D. K. Bandler, 11 Stocking Hall, Cornell University, Ithaca, NY 14853.

Sept. 23-24---SOUTH DAKOTA STATE DAIRY CONVENTION. Downtown Holiday Inn, Sioux Falls, SD 57100. Contact: Shirley W. Seas, Dairy Science Dept., South Dakota State University, Brookings, SD 57007, 605-688-5420.

Sept. 25---FOCUS ON FOOD SCIENCE SYMPOSIUM III, "Modern Meat Technology---Microbial Considerations." Kansas State Union. Contact: D.Y.C. Fung, Food Science Graduate Program, Call Hall, Manhattan, KS 66506, 913-532-5654.

Hazardous Wastes, *con't. from p. 214*

will be inspecting hazardous-waste facilities to make sure that they meet the EPA standards. Those standards are supposed to ensure that dumps are in geologically suitable locations where rainwater can't leach hazards into wells used by many municipalities for drinking water. Inspecting the 26,400 hazardous-waste facilities that the EPA has counted, ranging from on-site warehouses and settling ponds to incinerators and modern landfills, will take five to 10 years, Clawson of the EPA forecasts. "The strategy will be to get the good sites permitted first and the bad sites closed," she says. Until inspections are made and permits granted, facilities will be allowed to keep operating under interim status.

Meanwhile, pressure for more sites is growing. Industry usually has been reluctant to talk about the need for waste facilities because most companies don't want to be depicted as hazardous-waste producers. But now "there's some indication that industry is concerned about the long-term liabilities," says Mary Kavlacheck of the New York Department of Environmental Conservation.

Reprinted from The Hoosier Sanitarian, *December, 1980 issue. Originally published in* The Wall Street Journal, *November 18, 1980.*

JFP Abstracts

Abstracts of papers in the May Journal of Food Protection

Residual Sulfur Dioxide in some Thai Noodles, Amara Kingkate[1], Chanchai Jaengdawang[1], Patraporn Chakrangkoon[1], Chaweewon Halilamian[1], and Masatake Toyoda[2*], Division of Food Analysis, Department of Medical Sciences, Ministry of Public Health, Bumrung Muang Road, Yod-se, Bangkok 1, Thailand and National Institute of Hygienic Sciences, Osaka Branch, 1-1-43 Hoenzaka, Higashi-ku, Osaka, Japan

J. Food Prot. 44:334-336

A survey was made of residual free and combined or total sulfur dioxide in Thai noodles. Included were 11 samples of Keau-teo, 24 samples of Wun-sen and 9 samples of Sen-mee, which were dried noodles made of rice flour or mung bean flour. Sulfur dioxide was detected by the modified Rankin method. One sample of Keau-teo contained 136 ppm of SO_2, whereas the SO_2 contents of Wun-sen ranged from 0 - 157 ppm. The Sen-mee contained from 0 - 285 ppm of SO_2. The total SO_2 content of all Thai noodles tested was within the permissible limit of 500 ppm in Thailand. In addition, the SO_2 content of noodles before and after cooking was determined using 11 samples of Wun-sen, 2 of Keau-teo and 3 of Sen-mee. The SO_2 in noodles decreased about 70% during cooking.

Enzymatic Cleaning of Cellulose Acetate Membrane Reverse Osmosis Systems, W. J. Harper* and M. E. Moody[2], Department of Food Science and Nutrition, The Ohio Agricultural Research and Development Center, Columbus, Ohio 43210

J. Food Prot. 44:337-340

A comparison was made of several methods of evaluating the efficacy of enzyme cleaning of a tubular reverse osmosis (RO) system: (*a*) flux restoration, (*b*) dissolved solids level in permeate during cleaning and (*c*) removal of the radioisotope ^{33}P. Microbiological evaluation was used as the reference method. Volumetric flux restoration and dissolved solids levels in permeate during cleaning were of little value as indicators of cleaning efficiency. When these methods suggested adequate cleaning, subsequent swabs of equipment parts or determination of counts in permeate and/or concentrate at start-up 12-24 h after cleaning showed ineffective cleaning. Swab techniques were useful in identifying areas of concern. Addition of ^{33}P-inorganic phosphate to whey resulted in immediate absorption of the isotope to the membrane surface. Measurement of the ^{33}P-phosphate during cleaning provided a quantitative measure of soil removal that could not be achieved with other methods. The ^{33}P-phosphate technique indicated that soil removal is cyclic in nature, with alternating removal and redeposition. The ^{33}P technique, while of value only as a research tool, can be helpful in determining areas of minimum turbulence in a RO system and may be useful in evaluation and improvement of equipment design.

Effects of Nitrite and Sorbate on Bacterial Populations in Frankfurters and Thuringer Cervelat, Catherine M. Hallerbach and Norman N. Potter*, Department of Food Science, Cornell University, Ithaca, New York 14853

J. Food Prot. 44:341-346

Four batches of frankfurter emulsion were prepared with no additives, 0.26% potassium sorbate, 140 ppm of sodium nitrite plus 550 ppm of sodium isoascorbate, and 40 ppm sodium nitrite plus 0.26% potassium sorbate plus 550 ppm sodium isoascorbate, and processed. Five batches of thuringer cervelat emulsion were prepared with no additives, 0.26% potassium sorbate, 156 ppm of sodium nitrite, 78 ppm of sodium nitrite plus 0.26% potassium sorbate, and 78 ppm of sodium nitrite plus 156 ppm of sodium nitrate, and processed. The finished products were stored aerobically and bacterial growth patterns were monitored. At 20 C, presence of sodium nitrite and potassium sorbate, separately or together, in the frankfurters were without appreciable effect on total aerobic, total anaerobic, gram-positive, and lactobacillus-pediococcus counts, although at 7 to 9 C these additives moderately lowered bacterial counts. Bacterial counts of the thuringer cervelat were not affected by sodium nitrite, potassium sorbate or sodium nitrate at either temperature. *Staphylococcus aureus* and *Clostridium perfringens* were inoculated into all emulsions before further processing to determine if the modified cures, or possible changes in normal microflora, influenced these pathogens. *S. aureus* was reduced to below detectable levels after heat-processing in all systems. *C. perfringens* survived processing and then underwent equally slow death in all stored frankfurter emulsions, and stabilization of counts in thuringer cervelat emulsions. Results indicate that the modified cures did not appreciably alter the natural microflora of these products, nor survival of added pathogens.

Production of Italian Dry Salami, I. Initiation of Staphylococcal Growth in Salami Under Commercial Manufacturing Conditions, J. Metaxopoulos[1], C. Genigeorgis*, M. J. Fanelli, C. Franti and E. Cosma[2], Department of Epidemiology and Preventive Medicine, School of Veterinary Medicine, University of California, Davis, California 95616

J. Food Prot. 44:347-352

Three strains of *Staphylococcus aureus* (S-6, 137 and 472) were inoculated, in duplicate, into Italian-style dry salami made with finished product as starter and processed under commercial manufacturing conditions. Five levels of *S. aureus*

ranging from 2.2×10^2 - 1.8×10^7 cells/g were used. A fourth strain (264) was inoculated at a level of 10^5 cells/g. All strains of *S. aureus* grew at every level of inoculation, but the amount of growth was dependent on inoculum size. Strains S-6 and 472 increased in number by 1.2 - 2.9 logs (mean 2.14) at inoculum levels of 2.3×10^2 - 2.5×10^3 cells/g, and by 2.1 - 3.2 logs (mean 2.66) at inoculum levels of 3.7×10^4 - 6.6×10^5 cells/g. Strain 137 was very sensitive to salami environment and only increased by 0.47 - 1.86 logs (mean 1.23) even at the greatest inoculum level. Strain 264 increased in numbers by 1.5 logs in the presence of 5×10^5 inoculated lactobacilli/g and by 2.5 logs in the presence of 6×10^4 naturally occurring lactic acid bacteria. Staphylococci occurring naturally in salami mix were unable to grow to levels greater than 2×10^4 cells at any time during processing of experimental sausages. Thermonuclease was detected only in salamis inoculated with strains S-6 and 472 at initial levels of greater than 3.7×10^4 cells/g and only when growth reached levels greater than 10^7 cells/g. No enterotoxin was detected in any of the inoculated samples. Development of regression equations allowed description of the growth of inoculated *S. aureus* in the salami during manufacturing as affected by a number of variables.

Role of Lipids in Growth and Lipase Production by *Rhizopus stolonifer*, **Harish Chander, V. K. Batish* and Om Parkash, Department of Dairy Bacteriology, National Dairy Research Institute, Karmal-132001, India**

J. Food Prot. 44:353-354

A study was conducted on the requirement of lipids for growth and lipase production by *Rhizopus stolonifer*. Growth and lipase production were suppressed by incorporation of lipids, namely olive oil, butter oil, tributyrin, tricaproin and tripropionin, into the growth medium.

Microbiology of Beef Carcass Surfaces, **G. L. Nortje* and R. T. Naudé, Animal and Dairy Science Research Institute, Private Bag X2, Irene 1675, South Africa**

J. Food Prot. 44:355-358

In a survey at a local abattoir, agar sausage samples were taken at 10 carcass sites on each of 156 beef carcasses at different positions along the dressing line. The carcasses were selected to include all carcass types, viz. small (< 200 kg) and large (> 200 kg) as well as lean and fat carcasses. The 156 carcasses were divided into three groups of 52 carcasses each. Samples were incubated at three different temperatures to determine the aerobic count, mesophilic count and psychrotrophic count. Results of the survey showed that despite mean initial counts of $4,5$ - $7,7 \times 10^2$, intermediate handling and the subsequent contamination that took place along the dressing-line, the final chilling process rendered carcasses with acceptable bacterial levels ($< 2,5 \times 10^2$).

Effect of *Planococcus citreus* on Selected Quality Indices of *Penaeus* Shrimp, **R. J. Alvarez and J. A. Koburger*, Food Science and Human Nutrition Department, University of Florida, Gainesville, Florida 32611**

J. Food Prot. 44:359-363

Selected biochemical and microbial changes in *Penaeus* shrimp inoculated with *Planococcus citreus* were examined to determine the potential of this organism to contribute to spoilage of shrimp. Biochemical and microbial studies were conducted following storage of *Penaeus* shrimp at 5 C for 0, 4, 8, 12 and 16 days. Three samples, a control (raw shrimp), an irradiated (600 Krad) control and an irradiated (600 Krad) sample inoculated with *P. citreus*, were analyzed for changes in aerobic plate count, pH, total volatile nitrogen/amino acid nitrogen (TVN/AA-N) ratio, trimethyl amine-nitrogen (TMN) and total extractable protein (TEP). *P. citreus* counts increased in the inoculated shrimp from 3.0×10^3 bacteria/gram at 0 day to 1.5×10^8 bacteria/gram at the 16th day. By the 16th day of storage, the pH of the inoculated shrimp was significantly higher than the pH of the other samples. *P. citreus* inoculated onto irradiated shrimp was able to produce a TVN/AA-N ratio of 1.3 by the 10th day of storage, about the same time as that developed by the natural flora on raw shrimp. The increase in TMN content of the control (raw shrimp) and the inoculated sample were not significantly different. *P. citreus* was also able to bring about a significant decrease in the percent TEP of shrimp during storage. These changes indicate the capabilities of *P. citreus* in lowering the overall quality of *Penaeus* shrimp.

Data Structures for Integrating Quality and Cost Factors in a Foodservice Operation, **John P. Norback* and M. Eileen Matthews, Department of Food Science, University of Wisconsin-Madison, Madison, Wisconsin 53706**

J. Food Prot. 44:364-368

The information requirements for proper management of product quality and safety in a foodservice call for organization and manipulation of large amounts of data. This requires a structural organization to the data, which has large capacity while simultaneously being flexible enough to rapidly deliver information developed from the data. A matrix data structure meets these requirements and conveniently integrates new procedures and new products into a well - structured management information system. Such a structure is a convenient computational device, especially when implemented on a computer, and can be used for immediate feedback of information to the manager. Product quality and safety management requires that these functions be integrated into such a system and related to cost. Only in this way will the resource utilization impact of these control functions on the overall foodservice operation be apparent. Although in this paper the data structures are applied to foodservice operations, other applications are possible. In particular, dairy processing operations, meat and other food processing operations as well as food distribution systems, could all benefit from applications of such structures.

Update on Preenrichment and Selective Enrichment Conditions for Detection of *Salmonella* in Foods, Jean-Yves D'Aoust, Bureau of Microbial Hazards, Health Protection Branch, Health and Welfare Canada, Ottawa, Ontario, Canada K1A 0L2

J. Food Prot. 44:369-374

The search for short and sensitive cultural methods for detection of *Salmonella* in foods has met with limited success. Short (3-8 h) incubation of non-selective enrichment media do not provide conditions for effective resuscitation of stressed or injured salmonellae and result in unacceptably high numbers of false-negative results. Isolation of *Salmonella* is not dependent on the nutritional value of preenrichment media; simple media such as lactose and nutrient broths are equally reliable as highly nutritive sterility testing media. The need for detergents in non-selective enrichment of fatty foods and use of preenrichment transfer volumes greater than 1 ml is not indicated. Although selective enrichment in tetrathionate brilliant green (TBG) broth at an elevated temperature (43 C) increases method sensitivity, use of Mueller-Kauffman TBG under similar analytical conditions may be inhibitory to *Salmonella*. Refrigeration of preenrichment and selective enrichment broth cultures has been used successfully to provide greater analytical flexibility by increasing the number of days on which analyses can be initiated without engendering weekend work.

Update on *Salmonella* in Foods: Selective Plating Media and Other Diagnostic Media, William A. Moats, U.S. Department of Agriculture, Meat Science Research Laboratory, Building 201, BARC-East, Beltsville, Maryland 20705

J. Food Prot. 44:375-380

A variety of selective and differential agents are employed in plating media for isolation of salmonellae. Factors important in effectiveness of plating media are ability to support growth of salmonellae, inhibition of interfering bacteria, differentiation of salmonellae from other bacteria, and stability and reproducibility. Common types of salmonellae can be confirmed with a few simple biochemical tests. More extensive biochemical tests are required to differentiate biochemically atypical salmonellae from other bacteria.

Current Status of Immunofluorescent Methodology for Salmonellae[1], Berenice M. Thomason, Center for Disease Control, Public Health Service, U.S. Department of Health, Education, and Welfare, Atlanta, Georgia 30333

J. Food Prot. 44:381-384

The fluorescent antibody (FA) method for detecting salmonellae in food and feed samples is now an official method of the Association of Official Analytical Chemists. The need for a rapid screening method for detecting these pathogenic microorganisms in suspect products led to development of the FA method. A brief history of the development of the FA test, its evaluation by various investigators and its use by food laboratories are described in this report. Advantages and disadvantages of the method are discussed with suggestions for improvement of the technique.

Automation for Rapid Identification of Salmonellae in Foods[1], Paul A. Hartman* and Scott A. Minnich, Department of Bacteriology, Iowa State University, Ames, Iowa 50011

J. Food Prot. 44:385-393

Salmonella isolation and identification follow an inseparable continuum of steps from beginning to end. This paper, therefore, encompasses both aspects of the problem. The importance of recovering injured cells is mentioned, and problems in automating the isolation process are described. Rapid serological tests for identification of salmonellae directly in enrichment media are discussed. Suggestions are made for improvements in antiserum preparation and for automating certain serological tests. Various kits, procedures and automated equipment on sale or under development for the rapid and convenient physiological characterization of salmonellae and other *Enterobacteriaceae* are described. Examples are given of comparative efficiencies and potential problems that might be encountered. Finally, a prediction is made about the possible nature of future generations of highly efficient and inexpensive automated systems for *Salmonella* identification.

Current Trends in Foodborne Salmonellosis in the United States and Canada, Frank L. Bryan, U. S. Department of Health and Human Services, Public Health Service, Center for Disease Control, Atlanta, Georgia 30333

J. Food Prot. 44:394-402

In the United States, *Salmonella* has been isolated from over 31,000 persons during 1979; this figure is more than 60% higher than isolations made 18 years earlier. In Canada, the change from about 5,000 isolations from humans in 1977 to more than 8,000 in 1979 is also approximately a 60% increase, but over an interval of only 3 years. In the U.S. during 1973 - 1978, salmonellosis accounted for 40% of reported cases of foodborne disease and 23% of reported outbreaks of foodborne disease. In Canada during 1973-1975, it accounted for 39% of all reported cases of foodborne disease and 25% of reported outbreaks of foodborne disease. Foods most frequently reported as vehicles of salmonellosis in the U.S. were beef, turkey, homemade ice cream (containing eggs), pork and

chicken. Turkey was the most frequently reported vehicle in Canada. Factors usually contributing to these outbreaks (in order of importance) are improper cooling, lapse of a day or more between preparation and serving, inadequate cooking or heat processing, ingestion of contaminated raw ingredients, and cross-contamination. Changes in the relative frequency of isolations of particular serovars sometimes indicate spread of foodborne *Salmonella* by a particular food or the effectiveness of a control measure. Factors that perpetuate the *Salmonella* problem are *Salmonella*-contaminated rendered animal byproducts and contaminated feed, concentrating animals in feed lots and brooding houses, spreading *Salmonella* during animal slaughtering and processing foods of animal origin, national and international distribution of food and feeds, food preparation and storage practices in foodservice establishments and homes and environmental contamination from animal wastes and other sources.

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Dr. Anita Todd,
Nutrition Educator

Dr. Todd is Director of Nutrition Education for the Dairy Council of Arizona, which is a non-profit nutrition education organization supported by the dairymen of the state. As an affiliated unit of National Dairy Council, they provide nutrition information, literature, workshops and services to educators, health professionals, and consumers. Dr. Todd has an extensive educational background. Earning a Bachelor of Science degree in Home Economics from the University of Arkansas, she taught high school home economics before receiving a Master of Arts in Education and her Doctor of Philosophy in Education from Arizona State University. Child development and early childhood education were her areas of specialization. Dr. Todd is also a wife and mother.

Food...Your Choice!

"Ten years of Elementary classroom teaching make it possible to perform my responsibilities for the Dairy Council of Arizona. My primary responsibility in nutrition education is to encourage and aid Arizona schools to implement Dairy Council's nutrition education programs. Since nutrition is not always a required subject, my first job is to 'sell' teachers and/or administrators on the benefits of including nutrition in their busy schedule. Where enthusiasm is generated, training workshops are scheduled and materials ordered for each teacher. Materials provided to teachers of grades K-6 are curriculum kits called 'Food...Your Choice.' The kits have teacher guides with carefully outlined, activity oriented lessons, books of worksheets for the students, punch-out serving size photos of many foods, posters, records, song sheets and take-home material for the parents.

"In the workshops, basic nutrition is presented as teachers are trained to use the curriculum materials. In the three years since 'Food...Your Choice' has been available, it has appeared in more than 200 Arizona schools.

"Soon, the 'Food...Your Choice' curriculum will expand to cover grades 7-10. Teachers in selected subject areas will have teaching kits available, and it will be necessary to devise a different strategy for implementing 'Food... Your Choice' at this level.

Food...Early Choices

"The most exciting recent addition to Dairy Council's curriculum is a nutrition education program for preschoolers called 'Food...Early Choices.' Since I strongly feel early childhood is one of the best periods for learning in all areas, I was especially glad when National Dairy Council decided to develop this program, and I could be a part of development from the beginning.

"Trial runs for the materials and activities of 'Food... Early Choices' were conducted in Arizona day-care centers and preschools during the summer of 1979. When complete, the program made its national debut in Arizona through a project I developed for the Arizona Department of Education. The project, a part of Arizona's Nutrition Education and Training Program, aimed at the Child Care Food Programs of the state. In just six months, more than 445 preschool teachers in Arizona were trained in the nutritional needs of young children and the use of curriculum materials.

"Chef Combo, an appealing, mustached hand puppet is the star of the preschool program. The children are told he is a food expert and knows what is good to eat and how to fix good food. He easily captures the attention and affection of young children and adults, making it easy for the teacher to use him when introducing the more than 20 different nutrition learning activities in the program. Other versatile components of this program are colorful food picture cards, a food floor mat game, posters, a song record and playing cards. Through the use of these materials, the preschoolers learn why they need to eat good food, and why they need to taste new or different foods. They also learn to be clean and careful when working with food. Chef Combo also communicates with parents through information sheets sent home with the children. This program potentially influences the eating habits of thousands of families.

In Addition

"Paperwork galore is associated with arrangements, orders and follow-up of these workshops. In addition, I make presentations to other groups who are interested in nutrition education such as college classes, parent organizations and other nutrition educators. Ongoing nutrition education programs must be serviced with material replacement, consultation and sometimes re-motivation or 'pep talks.'

"Many authorities on health agree that good nutrition is the foundation of good health. For this and many other reasons, I consider it a privilege to be involved with the dairy industry and the Dairy Council of Arizona in its unique role of service to the Arizona community through nutrition education."

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