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Forestry, Research Institute for Veterinary Hygiene and Control of Animal Products, Sofia." [redacted] brief summary of each article [redacted]

STAT

Volume I

Page 7: "Streptococcus Mastitis in Cows of Co-operatives in the Sofia Area."

The Investigators examined 2,562 milk samples in 1956 and 1957 for pathogenic streptococci. The samples were from 2,337 cows from 38 different co-operatives of the Sofia milkshed. Pathogenic streptococci were confirmed in 2.09 percent of the samples. Followup of the samples with positive isolations disclosed only 6 cases of clinical udder infection. The other 43 streptococcus positive cows showed no clinical involvement. The streptococcal species were of the following types: Streptococcus agalactiae, 83.6%; Str. disgalactiae, 8.16%; Str. pyogenes animalis, 8.16%.

Page 15: "Mycobacterium tuberculosis in Musculature and Macroscopically Normal Lymph Nodes of Tuberculous Cattle."

The investigator examined 287 cattle with various forms of tubercular processes. Of 136 animals having the "primary complex" 6 or 4.4% yielded mycobacterium tuberculosis on culture of muscle tissue; 10 or 7.3% yielded the organism from grossly normal lymph nodes. Of 52 cases of chronic organ

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tuberculosis 8 (15.4%) tubercle bacilli were isolated from the musculature and from grossly normal lymph nodes. Similarly, 3 (10.7%) of 28 cases of chronic generalization; 3 (33.3%) of 9 cases of caseous pneumonia and 1 of 2 cases of caseous mastitis and in 2 of 2 acute miliary tuberculosis, t.b. bacteria were thus isolated from musculature and grossly normal lymph nodes. Of 58 tuberculin positive animals which had no visible lesions, 3 yielded t.b. organisms from musculature and 11 from grossly normal lymph nodes. Of the 46 typed cultures, 42 were M. bovinus and 4 M. humanus. On the basis of literature and personal investigations it is proposed that the existing laws pertaining to disposition of meat from tuberculous animals be changed, particularly in those tuberculous processes in which at present there are no restrictions.

Page 25: "The Preservation and Changes in Mycobacterium tuberculosis upon Storage of Whipping Cream and Butter."

Investigations were made on the preservation of M. tuberculosis during ripening of the whipping cream and storage of butter and buttermilk; the effect of various temperatures on t.b. bacteria in whipping cream were evaluated. The investigator developed an effective method for processing whipping cream and butter based on thorough concentration of mycobacteria in the sediment. Inoculated animals were observed 5 to 6 months. M. tuberculosis remained pathogenic in whipping cream and butter milk, for 10 to 35 days; in butter, for 4 to 8 months. Due to a combination of acidity, temperature and passage of time, mycobacteria underwent certain morphologic changes which ended in lysis. Temperatures of 70° C. for 30 minutes and 85° C. for 5 minutes did not completely inactivate mycobacteria in whipping cream under production conditions but pasteurization at 85° - 90° for 15 minutes proved effective in practice.

STAT

Page 33: "Investigations on the Preservation of Mycobacterium tuberculosis in Bulgarian White Cheese during Ripening and Storage."

The investigators tested survival of tuberculosis bacteria in Bulgarian White Cheese prepared from raw milk and from milk which had been heated to 68° C. for 10, 5 and 1 minute. The milk, the whey and the cheese mass before salting and the final product during ripening and storage were microscopically, culturally and by animal inoculation, examined for bacteria. The following findings were made: In all trials culturally and biologically viable and virulent t.b. bacteria were established (a) during the process of cheese ripening (b) in cheese prepared from raw milk up to the 120th day after production and (c) the cheese prepared from milk heated to 68° C. for 10, 5 and 1 minutes yielded M. tuberculosis for 30, 54 and 90 days respectively. The author showed that the prevalent treatment of milk at 68° C. for 10 minutes used for preparation of Bulgarian White Cheese is ineffective.

Page 39: "Investigations on Cows Milk in the Starazagora District in Respect to Mycobacterium tuberculosis and Brucella bovis."

During 1957 and 1958 the milk of 1274 cows from 25 agricultural communes and 74 private farms was examined in the district of Starazagora. Of 168 pooled samples and individual samples from those establishments which in the past have had tuberculosis infection, guinea pig inoculations showed no isolations of tuberculosis bacteria. Two samples proved positive for brucella. Of 1214 samples examined by the brucella ring test, 26 gave positive results and

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3

68 were doubtful. These findings show that the health measures in the eradication of tuberculosis in our country have been successful.

Page 45: "The Antagonistic Action of the Bacterium bulgaricus and Streptococcus thermophilus against Brucella bovis and Erysipelothrix rhusiopathiae."

In vitro and in vivo tests showed the antimicrobial action of bulgarian sour milk (I think this is yoghurt) against Brucella bovis and Erysipelothrix rhusiopathiae. Brucella organisms died after holding in the yoghurt for 2 1/2 to 3 1/2 hours at a temperature of 43 to 46° C. and acidity ph 3.9; at a temperature of 18 - 24° C. they first died at 89 - 96 hours ph 3.7. Erysi-pelothrix was killed in yoghurt after 2 hours at a temperature of 44 - 46° C. and ph 4.08, also after 68 to 72 hours at 18 - 24° C. and acidity ph 3.7. The effect of bulgarian sour milk on Erysipelothrix infection in vivo was tested in the following manner: controls were challenged with .03 cc of broth culture of pathogenic Erysipelothrix and fed the usual laboratory feed. Test mice were similarly infected but were fed the sour milk by pipette three times a day beginning either before infection, concurrently with infection or 2 hours after infection. The sour milk feeding continued for 6 days when the usual feed was resumed. All control mice died between 5 and 12 days after infection and were bacteriologically proven Erysipelothrix deaths. Mice fed sour milk (yoghurt) per os survived challenge for 30 days. Subcutaneous challenge with Erysipelothrix, however, resulted in the death of all mice. This may indicate a role of the sour milk in treatment of animals infected with Erysipelothrix.

Page 53: "Pathogenic E. Coli in Domestic Animals."

Six hundred and three specimens of feces from healthy domestic animals were examined for pathogenic E. coli. Nine strains were isolated, 4 of which had only partial antigenic relationship to known pathogenic E. coli. The remaining 5 strains were serologically identical or almost identical with known pathogenic E. coli. They were typed as follows: strain number 8 (lactose negative) and strain 150 - 026:B6:H11; the first was from a dog, the latter from a cow. Strain 268 was 026:B6:- isolated from a calf. Strain 324 was 086:B7:- isolated from a pig. Strain 462 was 086:B7:H? also isolated from a pig. The possibility is discussed that domestic animals may play a certain role in the epidemiology of infectious coli enteritis in nursing children.

STAT

Page 61: "Healthy Swine as Carriers of Salmonella."

During the years 1951 and 1952 tests were performed on internal organs, intestinal content and lymph nodes of swine at slaughter houses, in the Rusenski district. From the same group of swine 332 serum specimens were also collected for examination for agglutinins. Of 600 swine, 23 yielded cultures of Salmonella cholerae suis and 3 Salmonella typhimurium. Thirty-three of the 332 sera were positive for agglutinins against Salmonella cholerae suis. The principal organs of infection were the mesenteric lymph nodes and liver. If these organs were involved the O and H agglutinins in the serum titered between 1:200 and 1:400 whereas if the organisms recovered only from intestinal contents the titer was under 1:100. The isolations occurred principally in the third and fourth quarter of the year.

Page 67: "Analysis of Bacteriological Findings of Animals under Emergency Slaughter."

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4

A summary was made of findings of animals under emergency slaughter in the Varna district between 1950-1955. In the 6 years there were examined 7,479 pigs, 787 cattle, 343 calves, and 147 sheep and goats. Salmonella positive results were obtained in 23.3% of the swine tests, 2.3% of the cattle, 2.6% of calves and 3.4% of sheep and goats. 1,734 (99.7%) of the swine isolates belonged to group C serologically; of the cattle and calves most yielded group C. 5.4 of the tests on pigs yielded Erysipelothrix. Anthrax bacilli were isolated from 7 (0.9%) of cattle from 5 (1.5%) of calves and from 2 (1.4%) sheep. Only 6 swine (0.08%) yielded anthrax.

STAT

Page 73: "The Study of Distribution of Salmonella in Bulgaria."

During a period of 3 years (1948 to 1950), 1,022 bacteriological meat tests were performed in the district of Pleven, especially from emergency slaughter animals. Twenty-two salmonella cultures belonging to the types S. typhimurium, S. cholerae-suis, and S. enteritidis were isolated. The most strains, 15, were from emergency slaughtered pigs' meat. Four were from other edibles and one from a meat axe. Salmonella cholerae-suis was isolated only from emergency slaughtered pigs. It was interesting to find two isolations of Salmonella typhimurium in the buffalo.

Page 77: "Waterfowl and their Eggs, as Salmonella Reservoirs in the Pleven District."

Waterfowl in 14 communal settlements and 4 private farms were examined for salmonella. 5,865 fecal cultures and 358 eggs were bacteriologically examined. Salmonella were isolated from 11 fowl and 10 eggs. All belonged to the type Salmonella typhimurium and Salmonella enteritidis. Isolation of salmonella bacteria was positive only and exclusively from fowl in the private farms which reflects the poor hygiene and nutrition in these places. Human salmonella infections which occurred during this time which were epidemiologically evaluated as originating in waterfowl, were all traced to private establishments. In order to carry out successful combat of food infections in man it is necessary to begin with the establishments which have proven to contain infected birds. Experiences show that these are all private farms where conditions make anti-epizootic measures difficult.

Page 83: "Investigations of Paratyphus Enzootics in Ducklings and Goslings in the Plovdiv District."

During the years 1956 - 1957 ducklings and goslings were examined for Salmonella typhimurium. The following conclusions were made. 1. In the infected birds mortality of ducklings and goslings due to paratyphus in the infected establishments is 30 to 40%, in some cases even higher. 2. In the adult ducks salmonella positive diagnosis is 3.2% in the feces and 3.0% in the eggs. In geese it is 0.5% and 1.1% respectively. 3. Treatment of eggs with Lugol's solution before incubation increased hatchability of ducklings by about 5.35%. 4. Anti-salmonella serum decreased mortality in ducklings tenfold when it was applied between 5-8 days of age (2 - 3% mortality in the treated, 20% in the controls).

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Page 89: "Epidemiology and Etiology of a Food Poisoning due to 'Mettwurst'."

An outbreak is described involving 87 persons who became ill in 1956. The illnesses occurred in different households but the common article of food was mettwurst. The establishment where it was made was visited and portions of sausage, mettwurst and other meat products prepared the same day were tested bacteriologically. Twenty-three isolates of Salmonella brandenburg, 3 isolates of Salmonella muenster and 3 isolates of Salmonella enteritidis were obtained. Four isolates of Salmonella brandenburg and 1 each of S. muenster and S. enteritidis were also obtained from the environmental surroundings such as tables, troughs, etc. The probable entry of salmonellas into the meat filling is from the natural casing which is composed of intestinal wall.

STAT

Page 93: "Epidemic of Trichinosis from a Meal of Wild Boar."

An outbreak caused by fresh sausage prepared from a shot wild boar is described. The sausage was mixed with ground beef. Of special interest was (1) the first outbreak in Bulgaria due to consumption of meat from wild pig. (2) Of 37 persons who ate the roasted sausage none became ill but of 11 who ate raw sausage all became ill, 9 of them suffering from the severe form of trichinosis. Trichina was found in the left over meat as well as in the cutaneous muscles of the pig.

Page 97: "Examination of the microflora of pork in relationship to the duration of processing."

In healthy swine it took approximately 67 minutes after the instant of electrocution to the complete processing of the 100 kilogram carcass. From thus processed meat 4 isolates of E. coli and B. proteus pathogenic for white mice were obtained and also 4 isolates of Salmonella cholera-suis. A direct relationship was found between the time it took to process the carcass and the yield of bacteria from meat. It is considered essential to shorten the processing time to 30 minutes.

Page 103: "The Origin of Bacterial Contamination of Meat in the Sofia Meat-Co-operative."

The sources of bacterial contamination of meat and raw constituents of sausage products were investigated. 522 tests were performed on the surfaces of lamb, and beef, on the floor, walls, machines, clothes, hands of workers, and the air of the processing rooms. Gross bacterial contamination of lamb was shown to have taken place. An important source was careless handling resulting in the spilling of stomach contents on the surfaces of the meat. In order to lower the bacterial contamination it is essential to apply stricter measures for better sanitation of the surroundings and the technology of food and meat processing.

Page 111: "The Level of Sanitary Hygiene in the Cooperative Slaughter House in Varna."

The above establishment was examined for sanitary hygiene on the basis of bacterial and salmonella counts from floor and walls of the processing rooms before and after disinfection. 703 tests were performed and 2 isolates of Salmonella cholera-suis were obtained from tables in the slaughter room for

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swine. General gross bacterial contamination was found on the floor and walls of the slaughter room before disinfection, that is, during the actual course of the work. The best disinfective effect was obtained by the use of freshly prepared chlorine solution which had between 3.84 to 4.8% active chlorine.

Page 115: "Studies on a Disinfecting Agent as to its Effect on Bacterial Contamination and Preservation of Meat."

The investigators tried the activity of 1.5% chlorine, .02% ammargen (this must be a quaternary ammonium compound) and 10% acetic acid for washing meat; agents were then compared with controls washed with cold water only. 1. For washing meat, ammargen and acetic acid gave the best results. 2. Chlorine solution was a less potent agent. Eight days after the wash, bacteria multiplied on the meat surface. 3. Cold water wash did not improve the holding quality of the meat over no wash at all.

Page 119: "Veterinary Evaluation of the Hygienic Conditions in the Cooling Room For Milk Products; Test on New Fungicides."

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The hygienic conditions of ten cooling rooms for milk products were examined. Included were inspections of rooms for hard cheese and Bulgarian White Cheese, also butter, before and after disinfection. The count of bacteria and mold spores in the air, on the walls and on the shelves was determined. On the basis of findings the conclusion was reached that the hygiene of the inspected cool rooms was insufficient. The directions of operation were not strictly followed. Disinfection with 10% iron sulfate is not always effective. The trials of the new fungicides Kupral and F-2(oxy-quinoline tartrate) work more effectively than iron sulfate.

Page 125: "Study of Self Cleaning Effect of Slaughter House Effluent Water as Handled by Various Methods."

It was found that the necessary efficiency of filters, in order to rid the water of oocysts and helminth eggs demands a speed of less than 0.5 millimeters per second and a total holding time of over 4 hours. The data obtained showed that none of the systems examined renders effluent water from the slaughter rooms safe. The establishments examined were the meat cooperative at Tolbuchin and Haskovo and also the slaughter house of the town Samokov.

Page 131: "Investigations of the Bacterial Flora of Egg Shells and Attempts at its Disinfection."

The usual bacterial content of the egg shell is large and can be actually estimated on the basis of physical dirt. Hens' eggs if apparently clean will contain approximately 250,000 micro-organisms per cubic centimeter; "half unclean" eggshells will yield 79 million organisms per cubic centimeter and similarly completely dirty eggs yield 66 million. Goose eggs correspondingly yield .33 million, 254 million, and 560 million and duck eggs .58 million, 610 million, and 144 billion respectively. The biological peculiarity of water fowl seems to be responsible for higher bacterial counts in these species. Disinfection of the surface of eggs reduced the

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7

average bacterial count sharply. This not only has a hygienic meaning but also probably renders the eggs more suitable for long storage.

Page 137: "Assay and Caloric Value of Canned Meat and Fish."

The chemical analysis and the caloric value of 19 new types of canned meat and fish was performed. The average values for canned meat varied as follows: dry weight, 24.61 to 41.02%; fat, 11.40% to 25.44%; egg white, (I suppose this is albumin) 5.13 to 13.68%; ash, .96% to 1.8%; calcium, 0.125% to 0.220%; phosphorus, .012% to .120%; vitamin B₁, .06% to .14 milligrams percent; carotene, .066 to 1.06 milligrams percent; calories, 152 to 291 per hundred grams. The average values of the assays for several types of canned fish varied as follows: Dry weight - 33.94 to 48.25%. Fat - 10.54 to 32.30%. Albumin - 11.77 to 19.98%. Ash - 1.57 to 4.25%. Calcium - .084 to 1.105%. Phosphorus - .130 to 2.115. Carotene - .121 to 3.87 milligrams per cent. Calories - 177 to 351 per hundred grams.

Page 143: "Assay and Nutritional Value of Several By-products of Beef, Pork and Mutton."

Highest values were found for cattle tongue, high albumin in the 3 types of liver and also high level of vitamin A, especially in sheep liver.

Page 147: "The influence of Thermal Treatment on the Enzyme Content of Honey."

The investigators tested the influence of temperature on the enzyme content of honey in ten trials. It was established that 60 - 62° C. for not longer than 24 hours is the best most advantageous temperature for treatment. Higher temperatures and longer application reduce the enzyme content and the taste qualities.

Page 151: "The Salt Balance in Bulgarian White Cheese."

This merely points out that the whey which comes off during the preparation of this cheese is balanced by the salt content of the final cheese. They seem to feel they can judge the freshness or the desirability of lots of cheese by the salt content.

Page 155: "The Relationship between Cheese and Whey During the Ripening of Bulgarian White Cheese."

The authors point out that the brine used for aging the cheese is an influence on its content of albumin and in general on quality and they demand stringent regulations regarding these various ripening solutions.

Page 161: "Explanation of the problem of blackening of the Bulgarian White Cheese."

The black discoloration sometimes found on this type of cheese is apparently due to tannins which leech out of the wooden containers.

Page 165: "Studies on the Reddening of Salted Hides."

The investigators isolated halophilic pigment-producing micrococci from red

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discolored hides. The species Micrococcus roseus and Micrococcus corallinus were found. A mixture of 1 to 2% paradichloro benzol or 2% naphthalene added to the salt cure protected the hides from red discoloration, even under undesirable storage conditions.

Page 171: "A Case of Ichthyophthirius Multifiliis of a Rainbow Trout."

This describes a massive invasion of the gills of a trout with Ichthyophthirius multifiliis. This parasitosis apparently resulted from raising the temperature in the basin to 20° C. The measures taken to control this invasion were an increase in the rate of flow of the stream and lowering of the temperature to 15° C. after which no further losses were observed.

Volume II. (1960)

Page 6: "Investigations of Tuberculosis in Hens in Relationship to Hygienic Meat Inspection."

166 hens and cockerels positive for tuberculosis were examined for the presence of Mycobacterium tuberculosis in the musculature. 33 of the fowls showed no macroscopic evidence of tuberculosis. The highest percentage of isolations of Mycobacterium tuberculosis (83.3%) was obtained in the musculature of those fowl which had obvious changes in more than 2 organs; the lowest isolation rate (42.4%) was found in those fowl which had no macroscopic evidence of t.b. In those fowl which had macroscopic evidence in two organs only, the isolation was 69% and in liver and spleen only, 64%. Chickens with evidence of tuberculosis in the liver only yielded 51.9% positive isolations from musculature. The strains of M. tuberculosis isolated from the musculature was typed as M. tuberculosis variety gallinaceus. On the basis of literature and own observations and the scientific groundwork for changes in the veterinary hygiene of meat inspection laws were proposed.

STAT

Page 13: "Comparative Studies on Methods of Mycobacterium tuberculosis Isolation from Milk and Milk Products."

The following methods were compared. (A) Various amounts of milk processed - 25, 50, 300 and 3000 mls. (B) Dilution of the milk with equal quantities of water or 60% alcohol. (C) Suppression of contaminant flora in the sediment with penicillin, biomycin, sulphuric acid. (D) Liquefaction of cheese albumin with 5% sodium hydroxide, 6% potassium hydroxide or pepsin hydrochloric acid mixtures. The isolation of M. tuberculosis was in guinea pigs. Results were as follows: (A) The highest percent isolations occurred in lots of 300 to 3000 mls. (B) Higher concentrations of M. tuberculosis were obtained by dilution of the milk with equal volumes of water or 60% alcohol. (C) Excellent suppression of contaminant flora with biomycin, without influence on Mycobacterium tuberculosis. (D) The highest percentage of isolations of M. tuberculosis after liquefaction of milk products with pepsin hydrochloric acid mixture.

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9

Page 21: "Leptospirosis in Slaughtered Animals."

Microscopic, cultural, serologic and hystologic tests were performed on 205 pigs, 271 cattle, 42 buffalo, in a slaughter house in Sofia. These were all apparently healthy animals. 53% of the pigs, 12.5% of cattle and buffaloes disclosed agglutinins for various leptospiras in the serum. Titers in swine were 35% positive for Leptospira pomona, 21.% for Leptospira mitis, 15% for Leptospira icterohaemorrhagiae, and single positives for Leptospira canicola and Leptospira grippotyphosa. Cattle and buffaloes' titers 8% positive for L. pomona, 3.% for L. mitis and single positives for L. batavia, L. bovis and L. icterohaemorrhagiae. Certain individuals had agglutinins for more than one leptospiral species. Culturally, from kidney tissue, 20 isolates of leptospira were obtained from swine, one from cattle and one from buffalo. The types were L. pomona (16), L. mitis (4) and the other two still not determined. These investigations show that the organs of healthy slaughtered animals, especially swine, are possible sources of infection for slaughter house workers and other people. Exhaustive studies are recommended to determine the survival of leptospira in these tissues.

STAT

Page 29: "The Resistance and Inactivation of Salmonellas in Duck Eggs and Mixtures."

Salmonella typhimurium, enteriditis, muenster, hvittingfoss, senftenberg were tested for resistance to cooking in eggs; the mixtures of duck eggs after addition of powdered sugar, sodium chloride, ammonium carbonate and sodium citrate were also tested. The salmonella dye-off was also tested in large eggs after cooking in simmering water (98°C.) and the dyeoff occurred in 13 minutes. If eggs are cooled for 10 minutes at room temperature, this time can be reduced to 10 minutes. Salmonella killing time in egg mixture with .4% ammonium carbonate and 1.5% sodium chloride was complete after a short pasteurization (10 seconds) and a temperature of 67° C. The material of choice for preventing coagulation of the mixture during the heat processing was the ammonium carbonate in combination with sodium chloride. Mixture with sodium citrate gave the mixture a definite off flavor. The addition of powdered sugar as an anti-coagulant and an aid in killing salmonellas was not effective.

Page 39: "The Survival of Salmonellas in Floors."

Salmonella cholerasuis, typhimurium, enteriditis and muenster were examined for survival in various types of floors, and its relationship to pH., color. Also in the laboratory environment and in natural surroundings. Results showed that the viability of salmonellas in various types of floors may be preserved for 120 to 150 days. These results showed the importance of the floor as a way for spreading infection, and under certain conditions possibilities as a reservoir for salmonellosis. All types of salmonellas seemed to have approximately equal survival possibilities.

Page 47: "Pathogenic Colibacteria in Animals."

Fecal examinations were performed in 1301 healthy animals. (Cattle, buffalo, swine, fowl and rodents.) Twenty-two isolates were obtained whose antigenic structure was identical with the Coli. bacterium O26:B6. Additional fourteen

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10

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isolates were obtained which were agglutinated by antisera for pathogenic coli-bacteria but belonged to other coli groups. The significant isolates were from a buffalo calf, goose, calf, cattle and pigs. The possibility of transmission to man is raised. The partial similarity of antigens to other ordinary coli bacteria makes the diagnosis more difficult especially in those with non-homogenous antigenic structure. (025).

Page 55: "The study of Hygienic Condition of Machine Milking."

It was found that the average count of microorganisms after machine milking under unsanitary conditions is 6 to 12 times higher than milk obtained by hand milking. The largest percentage were Lactobacteria; in other significant amounts coli aerogens and caseolytes were found. The micro flora of milk was probably introduced from uncleaned and poorly cared-for milk apparatus and also udders, hands of the milkers and especially with the hand stripping of milk. Especially effective method of cleaning in disinfection of milk apparatus was the application of "calcinated soda?" and hot water. The chlorine solution had a weaker effect. The importance of daily cleaning and disinfection is stressed.

Page 63: "Studies of the Quality and Keeping Qualities of Milk from the Sofia Milk Cooperative."

Pasteurized milk from the above establishment was tested by the investigators. It was found that milk stored at 16 to 18°C. in a period of 24 hours increased its bacterial content 40 times. At a temperature of 10 to 12° C. the milk remained unchanged not longer than 24 hours but at 3 to 5° C. it remained so 5 to 6 days. The average count of microorganisms, the count of proteolytic bacteria, and the titer to E. coli. are good rating points for deciding the storage duration of milk. While the reductase test in connection with organoleptic test can give the answer only after 24 hours, the alcohol test and the cooking test do not lend themselves well for this purpose.

Page 71: "Microbiologic and Dietetic Comparison of the Bulgarian Sour Milk (yoghurt?) and the Acidophylus Sour Milk."

Parallel microbiologic and dietetic examinations were performed on Bulgarian sour milk and acidophylus sour milk in order to clear several reports in the literature. Biochemically active strains of Bacterium acidophylum and Bacterium bulgaricum were propagated. When these were then inoculated into milk and cultured identically, no difference could be detected in acid production and morphology between the two strains. Similarly both types of sour milk had the capacity to multiply in the intestine of animals and children and suppress pathogenic bacteria such as salmonella enteritidis, and typhimurium. It was decided that both types of sour milk are equally beneficial. (I still like yoghurt.)

Page 79: "Studies of coloration of Bulgarian White Cheese."

Over a period of several years it was found that undesirable red-orange coloration is caused by pigment producing micrococci. The principal modes of introduction were improperly cleaned vessels for aging the cheese. It was found that disinfection of these vessels prevents discoloration.

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Page 85: "Vitamin A activity of Butter from Cow, Buffalo and Sheep's Milk." Vitamin A and carotene content of 41 samples of cow butter, 26 samples of buffalo butter and 16 samples of sheep butter were studied; changes in A vitamin content in 14 individuals of the 3 species after storage under different conditions were also tested. The following assay of vitamin A and carotene were found: (A) Cow butter. In winter 3.38 mgs per kg. Summer, 4.62 mgs per kg, average during the year 4.28 (extremes 1.95 to 8.92;); (B) buffalo butter. Winter 2.18, summer 2.80, average 2.61 (extremes .60 to 4.56); (C) sheeps butter. Average 3.52 (extremes 1.20 to 5.40). Storage of cow, buffalo, and sheep milk butter at 18 to 20° C. over a period of 15 days and at -5° C. and -18° C. over a period of 3 months did not affect the vitamin A activity of the butters. Storage at -18°C. for 9 months decreased vitamin A activity by about 5%.

Page 91: "Investigations of Sanitary Hygiene in the Slaughter Houses of Vraza and Mihailovgrad."

These two towns apparently gave better appearance than the previously inspected premises. They attribute this to proper usage of chlorine solutions and chloramine and proper cleaning in general.

Page 97: "Microbiological tests on Animal Blood for Human Consumption."

108 specimens of animal blood for preparation of blood sausage as well as 180 wipe cultures from surroundings and hands of workers in the establishment were tested. While the microorganism count in the freshly shed blood varied between 6900 in winter and 41,000 in the summer, it increased to between 9,500 to 2.33 million during the next three to four hours of storage. After a storage of the blood, the count of coli bacteria was noticeably increased which speaks of unhygienic conditions. The presence of anaerobic and hemolytic microorganisms was also observed. The ways in which the blood is contaminated indicated the only way to avoid it is the use of sterile vessels, knives and other utensils.

Page 103: "Methods for the Disposition of Meat from Sick Animals, and some Comparative Studies."

1949 specimens from sick animals and 874 specimens of similar meat from healthy animals were examined in order to show which laboratory method is best suited to establish whether the meat is fresh and whether it is suitable for consumption. Methods tested were: peroxidase activity, the pH of the meat extract, the amount of amino-ammoniac material, coaguable albumin in the meat extract, the relative amount of volatile fatty acids, the oxidation-reduction coefficient, the sublimate tests and the Nessler test. The tests showed that the assay for amino-ammoniac is the best criterion for establishing the freshness of meat from sick animals. 80 mg% is fresh meat, 80-130 mg% is doubtful and above that it is no longer to be consumed. The meat extract of sick animals showed a positive sublimate test, a positive coagulation of albumin with 10% copper sulfate, and a negative peroxidase test. pH over 6.4, amino-ammoniac over 50 mg% and failure of organoleptic changes also suggest meat of sick animal.

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Page 113: "Chemical Assay of Several Fresh Water and Sea Fish."

The chemical assay of 14 species of fresh water and sea fish was performed including the following: *Lucioperca lucioperca* L., *Salmo iridea* F., *Leuciscus idus* L., *Clupea Nordmani* Ant., *Cyprinus carpio* L., *Rhombus meoticus* P., *Caspialosa Kessleri pontica* Eichw., *Mugil cephalus* L., *Clupea cultiventris* Nordm., *Spratella sprattus phalerica* Risso, *Pomatomus saltrtrix* L., *Trachurus trachurus* L., *Scomber scombrus* L., *Sarda sarda* Bl. und *Clupea harengus* L., untersucht. The examinations involved the following: water, fat, albumin, calcium, phosphorus, and B₁ vitamin content as well as caloric value of the parts suitable for nutrition, (musculature) and also of the whole fish. The analysis of the musculature was between the following extremes: Fat, .61 to 21.83%. Albumin, 14.50 to 20.72%. Salt, .86 to 2.39%. Calcium, .023 to .39%. Phosphorus, .023 to .297%. Calories per hundred grams, 67 to 278. The musculature represented between 42.76 and 71% of the whole fish.

Page 121: "Investigation of the Health Status of Fish in the State Fish Hatchery at Samokov."

During the years 1958 and 1959 investigations were made in the largest trout hatchery of the country at Samokov. It was established that most of the work was being properly performed. Neither samples of water nor samples of bottom slime disclosed any pathogenic microorganism. During the examinations several illnesses of different types were observed, for example, watery yolk disease of embryos, hemorrhagic gastro-enteritis with a mortality of approximately 3%, tumor like growths of the liver, chronic hepatitis in the breeding fish and parasitosis (*Myxosoma cerebralis*) and *Ichthyophthirius multifiliis*. Several remedial measures were recommended.

Page 129: A similar investigation of health conditions in the carp fishery at Chelopechen.

It was determined that during the months of April through October the temperature of the water in the fishery varied between 10 and 28° C. and the pH between 7.3 and 8.8. The oxygen content varied significantly between 1.7 and 10.6 ml. per liter. The carp of all ages was found infected with trichodina, ichthyophthirius and coccidia. During the spring and summer of 1959, abdominal ascites disease was observed in the two year olds with approximately 8% mortality. Bacteriological examination disclosed *Pseudomonas punctata*, variety *ascitae* which was determined to be the cause of the outbreak. Treatment consisted of methylene blue in the feed, 30 grains in 100 grams of food. After 10 day treatment and an improvement in hygienic management the disease was controlled.

Page 137: "Zoo-hygienic Investigations in the Fishery at Starazagora."

This carp hatchery was found in bad hygienic state. A variety of illnesses caused by improper management were found, among them ascites disease, asphyxia due to lack of oxygen in the water, poisoning due to Paris green and parathion poisoning.

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Page 143: "Investigation of the Carp Fishery at Plovdiv."

Many faults in the building and management of this fishery were found. Mass infection with argulosis, dermatomycosis and many cases of poisoning were observed. Ascites disease was not observed.

Page 149: "Investigations on the Spread of Ascites Disease of Carp in the Pleven District."

On five premises in this district the ascites disease was diagnosed, caused by Pseudomonas punctata, variety plenia. The predisposing causes for the outbreak of the disease were determined to be a lack of hygiene in the basins and disorganized feeding causing a lack of essential nutrients.

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