

APRIL 5, 1973

MEMBERS PRESENT: Chairman Hickey, Messrs Young, Getto, Hayes, Howard and Prince

MEMBERS ABSENT: Mr. Dini

GUESTS: Jacque Crane, Nevadans for Better Nutrition
W. E. "Bill" Adams, City of Las Vegas
Ernest H. Scruggs, Health Division
Stan Davis, Association of Nevada Dairymen
James A. Edmundson, Health Division
Mark H. Anderson, Silverland Farms
Grant T. Anderson, Silverland Farms
Barbara Picetti, Upland Farms
John Picetti, Upland Farms
S. D. Mastroianni, State Health Department
John H. White, Minden Milk Products
Betty Ritter, Ritter-Gonzales Dairy
Newell J. Mills, Mills Jerseys
Frank R. Welsh, Rainbo Bread
Andre Alday, Minden Nevada Dairyman
Herb Witt, Chairman, Dairy Producers Council, Nevada
Farm Bureau
John Krema, Manager, Associated Nevada Dairymen
Carolyn Oxborrow, Collie Fanciers
Neil K. Holbrook, Safeway Stores
Phyllis Berkson, Nevada State Dairy Commission
Tom Bahan, Anderson Dairy
E. Brooks, Model Dairy
Bill Canepa, Nevada State Dairy Commission
Mary Wright
Bill Wright, Board of Directors, Nevada State Cattlemen's
Association
Frank Hooper, Rancher
Jack Boyd, Rancher

Chairman Hickey called the meeting to order at 8:00 on Thursday, April 5. The purpose of the meeting was to hear testimony on AB 790, 792, 888 and 920.

The first order of business was additional testimony on AB 793, which permits operation of noncommercial dog kennels in areas zoned for residence; exempts such kennels from business license.

Bill Adams, representing the City of Las Vegas, spoke in opposition to this bill. Mr. Adams stated that it was the opinion of the city that a city lot is not of a sufficient size to house more than 3 dogs at any one time. They do have a special ordinance for dog fanciers which permits them to have an additional 3 adult dogs on the premises. They must license these dogs and get permission from the local health department. In order to get this permit they must have certain minimum size lot and

meet certain sanitation and other standards. All puppies must be removed from the premises after 6 months of age. But Mr. Adams stated that they did not feel that the bill had any place here on the state level and should be handled on the local level.

Mr. Warren, representing the Nevada Municipal Association, stated that he concurred with Mr. Adams statements and that he felt that this bill would impose an irritant on those residents in that area and they should really not have to be subject to it. They agree with the approach of Las Vegas and that it should be on the local option. Felt it would be a burden on those citizens that do not care to live next door to a dog kennel and it would be very difficult to control.

Mr. Hickey asked Mr. Warren if Reno and Washoe County were as flexible as Las Vegas to which Mr. Warren said that he had not asked Reno that question specifically but Reno felt that this bill was not really necessary and that the sale of puppies would put these people in competition with private industry.

Mr. Getto stated that the proponents of the bill were willing to put a limit on the number of puppies to be sold and would this help. Mr. Warren said that it would help a little but it would still not limit the amount of noise or problems that may arise.

There was no further testimony on AB 793.

Next bill to be considered was AB 790, which provides removal of price controls on fluid milk and cream.

Mr. Davis of the Association of Nevada Dairymen spoke first stating that he felt there would be problems created with this bill and that it would be bade for the dairies.

Grant Anderson, Silverland Farms, stated that he was interested in maintaining the status quo of the Dairy Commission. This bill would do away with the powers of the Dairy Commission. The Dairy Commission was created to help stabilize the dairy industry and help it to maintain its position in the field of agriculture. In the community in which Mr. Anderson does business the dairy business is one the few business of agriculture in which a person can still make a profit.

Repealing the price control would not help the consumer and it would be difficult to serve the people when prices fluctuate widely. Milk does not flow freely from dairy man to the consumer if there isn't some type of control. The dairyman does not want federal government to do the controlling which would not be in the interest of the people who consume the product.

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Mr. Anderson finished by saying that the dairyman is at the bottom of the heap and he is the one is going to feel the impact of the price change.

Mr. Getto then asked Mr. Anderson when was the last time that the producer has received a price raise. Mr. Anderson stated that the Dairy Commission at its last meeting raised the amount received by the dairyman for the first time in over three years, and over the last 15 years the dairyman has received only 2.5¢ of the total amount that milk has gone up.

Mr. Picetti, Upland Farms and Associated Nevada Dairyman, stated their group had 27 producers in it and they feel that there needs to some type of price control. Mr. Picetti stated that he could remember when there had been no price controls and that it was a very rough time for all of them.

Mr. Getto asked if he thought that the Dairy Commission has been a consumer protection commission as well as a stabilizer for the industry. Mr. Picetti replied that it was indeed. He went on to say that six to seven years ago there were about 100 producers in their group and now there are only 27.

Mr. Hayes asked if this included southern Nevada to which Mr. Picetti replied that it did not.

As a final question Mr. Getto asked Mr. Picetti if there was an oversupply of milk at the present time. Mr. Picetti say that actually there was a shortage.

Next was AB 888, permits sale of raw milk, prescribes inspections of milk producers, and regulates use of antibiotics in dairy animals, and AB 920 which permits sale of high quality raw milk in Nevada.

First to speak in favor of this bill was Jacque Crane. Her comments may be found in Attachment I. Ms. Crane finished by reading a letter from Mrs. M. Bailey of Gabbs, Nevada, See Attachment II, and presenting to the committee copies of a report by Dr. Francis M. Pottenger, Jr., entitled "The Effect of Heat-Processed Foods and Metabolized Vitamin D Milk on the Dentofacial Structures of Experimental Animals." See Attachment III.

Herb Witt, dairyman and member of Nevada Dairy Producers, spoke against the bill. He said that he would agree that people may want to buy raw but to think that they can go back to the good old days and run out to the farm and get a container of raw milk is completely wrong. It would be most unlikely that raw milk would be cheaper as the dairyman would be liable for the product and in order to avoid any lawsuits would have to carry additional insurance etc. Main thing would be the price though as people would expect it to be cheaper and would not be.

Jim Edmundson of the Health Department who is the milk rating officer for the State, spoke against the passage of these bills. He stated that it would be difficult to certify that this milk would be free of salmonella, which is the biggest problem with raw milk. It takes up to 48 hours to run samples to check for this. Salmonella organism is one that is found universally - it can be found in shedder cows. It would be likely that a veterinarian could go to a producer and certify today that all the cows were free of organisms but probably would not be able to give this same guarantee 1 or 2 weeks from now. Even when the certificate states that all animals are free from organisms every so often 1 will crop up and when that happens immediate action must be taken. In the meantime possible organisms have gotten in the milk.

Mr. Edmundson presented a report of a death from certified raw milk to the committee. See Attachment IV

He also stated that there was no fiscal note attached but she stated that a vet would have to be hired to go out and check the cows at least once a month.

Mr. Young asked Mr. Edmundson to explain what salmonella was. Mr. Edmundson stated that it was a strain of organism that caused a dysentery type disease which was not usually fatal except in cases where person had some other disease which might tend to lower his resistance and put him in a weakened condition.

Mr. Edmundson stated that in these bills there is no regard to the amount of coliform in the milk, no examination of the milk for infectious hepatitis. He also stated that he knew of no market that had aerated milk on its shelf.

As to the nutritional change - milk is the only food that is ingested as a liquid and digested as a solid. Pasteurization tends to soften the curd and PH in the stomach immediately curdles it.

Mr. Edmundson then introduced Mrs. Mildred Pale, Consulting Nutritionist for the Department of Health, who explained the nutritional qualities of milk. Mrs. Pale said that the enzymes in milk are immediately broken down by the pH in the stomach but the real problem was with salmonella which can be a real problem for older people and babies, who are hardest hit. Pasteurization kills these germs as well as tuberculin and other bacteria. The protein in the milk is the same whether pasteurized or raw. Mrs. Pale stated that she liked raw milk and if she really wanted to drink it she would move where she could handle it herself.

S. D. Mastroianni of the Health Department stated that he concurred with Mr. Edmundson and wanted to add that there was also the problem of the fact that tests for streptococci take a long while.

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Mr. Getto asked if the pasteurization temperatures kill salmonella and the various other bacteria mentioned here.

Mr. Edmundson stated that tuberculin bacteria is killed at the present time at 161° for 15 seconds and salmonella is killed quite easily and readily at a thermal temperature of 130°. All the present bacteria now found in milk are killed by the present pasteurization temperature.

Mr. Hickey then asked how many states allow the sale of raw milk. Mr. Edmundson stated that he believed that there was between 10-15 including Oregon, Utah, and California which only allows as a local option not on the State level.

Jacque Crane then said that the main thing that they wished to have is the freedom of choice to drink the milk of their choice.

AB 792, requires package dating of fresh baked goods and dairy products. Mr. Neil Holbrook, attorney for Safeway Stores dealing exclusively with milk laws, began by stating that this bill is not unlike those of other legislatures all over the country. There are similar bills in Maryland, Nebraska, and California. His remarks may be found in Attachment V. There were no questions for Mr. Holbrook.

Chairman Hickey then re-opened the testimony for AB 899, which provides for special property tax on cattle to combat predatory animals. Bill Wright of the Deeth area and a board member of the Nevada Cattlemen's Association, stated that he was opposed to this bill. He stated that had he been at the ranch this morning he would be hunting two coyotes who had killed a calf of his. These two will be hunted down and killed. They protect the coyotes on the ranch and have had to kill only a total of 5 in the last 8 years.

Feel that this terribly unfair to have a tax levied on them to protect other peoples cattle and sheep. Not opposed to what they do to protect themselves as long as it does not affect other people who are a part of the same business.

Mr. Young asked Mr. Wright if he did not remember anything about this bill from a board meeting or something of that nature. Mr. Wright said that he vaguely remembers discussing something about predators but did not realize that it had gone this far. He did not realize that they were discussing something that would be mandatory.

Mr. Wright said that did believe that they had a special meeting in Elko to discuss this but he had another committment and did not realize that this is what came about.

Mr. Jack Boyd of Halleck also spoke in opposition to this piece of legislation. He stated that main reason was that a program of this type seems to always be never ending and always expanding. He also said this is a very controversial issue in that the most complete study to date states that in studying the stomach content of many coyotes it was found that the contents were found to be 75% rabbits, rodent and carrion and 2/3 of 1% was calf, colt and pig.

He also said that he did not believe that this bill would do too much to control the problem for the cattlemen and that he did not believe the problem was severe enough to worry about.

Another of his worries was the method that might be used to combat the problem. He stated that he was opposed to many of the methods.

The sheep business has gotten bad public relations because of the use of poison to control coyote and he would not like to see anything that might hurt the image of the cattle industry.

Believe that there should be much study and investigation into the problem before any laws or taxes are levied. But if such a bill were to be enacted it should be voluntary and not mandatory. Mr. Boyd then presented a pamphlet entitled "Common Sense in Predator Control." See Attachment VI.

Final speaker was Frank Hooper who stated that he too was opposed to this bill as he felt that it was a bad mistake to kill the coyote. He also felt that this thing might just keep growing and growing. He said that he thought that there had been a marked reduction of coyotes since last fall. Also felt that many other things work against the coyote. He also felt that too many cattlemen know that this bill is in the hopper.

Mr. Boyd said that he felt that the coyote kept the rodent population and eliminate the sick and injured species. The renegade should be destroyed. The most effective way of control is to single out the offending beast and eliminate them.

As there was not further business Chairman Hickey adjourned the meeting at 10:15.

Respectfully submitted,

Sandee Gagnier

ASSEMBLY

AGENDA FOR COMMITTEE ON AGRICULTURE

Date 4-5-73 Time 8:00 Room 214

| <u>Bills or Resolutions to be considered</u> | <u>Subject</u> | <u>Counsel requested*</u> |
|--|--|-------------------------------|
| AB 790 | Removes price controls on milk and cream | |
| AB 792 | Requires package dating of fresh baked goods and diary products. | |
| AB 888 | Permits sale of raw milk. | |

*Please do not ask for counsel unless necessary.

CONSUMPTION OF RAW MILK VERSUS PASTEURIZED MILK

The U.S. and State Departments of Agriculture and other state and federal agencies have taken an arbitrary stand against the sale of raw milk and through various propoganda efforts would have the public believe that pasteurized milk is as good or better for the health of the consumer. Indeed, the departments contend that the consumers of raw milk run the risk of a variety of milk-borne diseases which they infer are not likely to be contracted through the use of pasteurized milk. Further, they insist that pasteurized milk does not inactivate any necessary enzymes contributory to human health; that it tastes as good as raw milk; that it only slightly affects digestibility; and, that pasteurized milk is as nutritious as raw milk.

It is significant, however, that thousands of doctors, dentists, nutritionists, biologists, bacteriologists and other professionally accredited persons support the consumers' wish to have a freedom of choice in the selection of their milk and other foodstuffs.

Certainly the possibility of a consumer contracting a milk-borne disease should be the most important consideration in allowing the sale of raw milk.

Therefore, it should be noted that during the past 50 years some 70 per cent of milk-borne epidemics have been traced to pasteurized milk.

The State of Oregon has always allowed the sale of raw milk in limited quantities, according to Dr. Monroe A. Holmes, Public Health Officer and Assistant Epidemiologist of Portland, Oregon.

On April 2, 1973, Dr. Holmes stated that in his 17 years of public service in Oregon there have been no reported and proven milk-borne diseases afflicting the consumer. He further noted that while there have been some incidents of suspected diseases among some dairy cows, no cases have been confirmed. 99 per cent of the milk produced in Oregon is pasteurized---however, consumers in that state do have freedom of choice in their purchase of milk.

Dr. George L. Humphrey of the California Department of Public Health reports that there have been relatively few outbreaks of disease in man during the period of 1963-1972 which can be attributed to raw milk produced and consumed in that state.

(Con't.)

In a recent report to the Nevada Division of Health, Dr. Humphrey noted that there were relatively few occurrences of consumers being afflicted with problems resulting from consumption of raw milk. It is noteworthy that he particularly noted that one particular dairy involved in disease outbreaks is also the same one involved in more recent outbreaks. Furthermore, he stated that neither of two outbreaks associated with use of raw milk in 1971-72 occurred as acute episodes as in the classical nature of food borne disease.

Aside from consideration of diseases, which should and can be controlled by proper care and inspections, the next most important argument in favor of raw milk concerns nutritional quality and value, which is disputed by the agriculture departments.

Today, the need for adequate protein consumption for man's health is universally recognized. Meat and milk are the primary sources for obtaining protein in America. The price of meats has skyrocketed to a point that nation-wide boycotts are taking place. One quart of milk contains more protein than an average-size steak, and many nutrition-conscious consumers are relying on milk to support their protein needs.

Basically, pasteurization is performed by heating raw milk. Originally, this practice was proposed only as a temporary measure to insure safe, clean milk for the consumer owing to a variety of disease problems, which have now, for the most part been brought under control. Various agriculture and health officers would have us believe that pasteurization is a simple, harmless and health producing practice.

Conversely, proponents for sale of raw milk believe numerous tests and examinations made in this country and many others definitely prove that pasteurization is not so harmless nor nutritious.

Pasteurization causes a loss of calcium and the destruction of enzymes, antibodies, hormones and vitamins---all of which are health-building and protective properties, present in raw milk. The heating process of pasteurization is definitely known to lessen the digestibility of milk and subsequently the biological efficiency of protein. It is true that some persons, particularly those of negroid or oriental races, after infancy, cannot digest or are allergic to milk in any form owing to the fact that their systems do not contain lactase enzymes.

(Con't.)

Contrary to pasteurization propaganda, Dr. Robert Liefman, who is an internationally recognized endocrinologist, maintains that, "Food in its raw natural state needs hardly any digestion in order to furnish the body with the vitamins, minerals and amino acids required for health."

According to the famed nutritionist, Dr. Carleton Fredricks, "Respected medical journals...have carried many reports indicating that the growth of children, like that of young animals, is more satisfactory on raw milk than on pasteurized.

"Many enzymes in raw milk are destroyed in pasteurization...At least one, phosphatase, has been proved important in the nourishment of infants...the crowning irony resides in the test for pasteurization: When a health department wishes to determine whether milk has been pasteurized, a search is made for phosphatase, and if any phosphatase activity is found, the milk is condemned," said Dr. Fredricks.

Other enzymes contained in raw milk are those concerning fat utilization and one which has a germicidal effect. Also, an anti-ulcer factor and anti-anemia factor present is destroyed by pasteurization, as well as Vitamins A, B₁, C, D and minerals. The practice of irradiating pasteurized milk with synthetic vitamin D has been denounced by the American Medical Association and others.

Dr. N. Philip Norman has reported that pasteurization destroys or at least, greatly reduces the lipids (lecithin) which normalize the use of cholesterol, which both occur naturally in raw milk. Also, he has stated "Pasteurization and homogenization inhibit bacterial activity and decreases spoilage rates. Thus, dairy products may be kept under refrigeration for ten days or two weeks...A kissing cousin to pasteurization is homogenization. This pseudo-scientific salvaging process is another boon to the dairy industry. In this process milk is squirted, under terrific pressure, through fine calibre tubes against a wall. As a result, fat droplets are broken up---completely and permanently...

"The dairy industry, in collaboration with the health authorities, has successfully imposed pasteurized milk upon most of this country. It now seeks to make homogenization of milk mandatory. Pressure is put on local grocers, chiefly in the form of trade deals. Tempted with the coaxing line that homogenized and pasteurized milk lasts longer and is returnable when stale, the grocers shy away from the distribution of raw milk...

(Con't.)

"If not sold, those stale products are salvaged by the industry and surreptitiously converted into other profitable items," Dr. Norman reported.

Probably the most extensive studies ever made concerning the effects of raw milk as compared to pasteurized milk consumed by both animals and human beings have been conducted by Dr. F.M. Pottenger, Jr. He has reported that raw milk consumption produced better bones and teeth than pasteurized milk, and that raw milk protected against or prevented dental problems, deafness, rheumatic fever, asthma and a type of arthritis.

According to M.W. McKie, M.D., "One should never underestimate the healing forces of nature for they are a vital aid to the body."

Because of the historically rapid development of our country and its society, the individual's rights have steadily become inter-twined with the general public's. Admittedly, some restrictions and qualifications of some rights are necessary for the common welfare of citizens.

However, if the state agencies that are responsible in matters of health protection relative to milk production are actually fulfilling their duties of inspection, etc., it would seem the likelihood of there being any danger in allowing Nevadans the right to purchase raw milk is: practically nil.

In all probability, a factual survey of dairying families would reveal that they have been drinking raw milk in preference to pasteurized milk---all of their lives---and, without contracting any health disorders as a result!

THE REASONS I PREFER RAW MILK TO PASTEURIZED:

1. It tastes better.
2. My studies indicate that it is more nutritious.
3. The control of T.B. and Bangs (Brucellosis) has made the drinking of it less fearsome.
4. I am convinced that much dirty, perhaps even diseased milk is foisted on the consumer all because it can be pasteurized and kill the most noxious of the bacteria present.

As a bacteriology major some years ago, the tests on raw certified and pasteurized milks showed a disproportionately large number of bacteria in the pasteurized samples as compared to the raw samples.

6. As a young, just graduated bacteriologist, I moved to a farming area where practically everyone drank raw milk from their own cows. Somehow I fully expected these raw milk drinkers to be ill. Naturally, I cooked all raw milk before using it. It took some years to find anyone who claimed to have a milk-borne illness. She was from a European country and had contacted bovine tuberculosis. This is rather unscientific, but the proof of the pudding is in the eating, and I have used raw milk for some years now, as often as I have been able to get it. None of the five children or parents in our family have suffered any known adverse effects from consuming raw milk.

(Signed)

Mrs. M. Bailey
Gabbs, Nevada

March 30, 1973

My name is Harriette Trudell, and I am here to present the testimony in support of AB 888 for the Consumers League of Nevada. These remarks were originally prepared for presentation by Charles Levinson of Las Vegas, and it is with regret that we have learned that because of his class schedule at the University of Nevada Las Vegas, he is unable to be present. I have been asked to refer questions or requests for elaboration of remarks to him, and he is most willing to discuss the League's position with any members of the committee. I do have with me, however, the minutes of the Board of Health meeting of May 18, 1972 to which I refer in this testimony. I would be most happy to share them with you.

We would like to start with some specific input regarding the past efforts of the League to co-operate with the State Board of Health regarding the quality of milk in Nevada.

On May 18, 1972, the State Board of Health held hearings in Sparks, Nevada regarding proposed changes for milk and regulations regarding milk production. Mr. Levinson attended those hearings to represent the consumer viewpoint.

Also present at that meeting was Dr. Otto Ravenholt, of the Clark County Health department.

Regarding the legalization of non-pasteurized or certified raw milk, I will quote from the minutes of that meeting. This is a statement from Dr. Ravenholt:

"In southern Nevada there has been a growing interest in the availability of non-pasteurized or certified raw milk. There has been a legal opinion that if there is a medical prescription for the use of raw milk, that would be a legal transaction despite the current regulations on milk.

The proposed regulations (as of May 18th, 1972) prohibit the sale of anything that is not pasteurized milk in Nevada and additionally provide that no such milk may be produced, stored, or offered for sale, etc. in the state of Nevada.

We ought to balance our restrictive measures against the benefits generally achieved by them. The 1970s have generated people who wish to do their own thing and who do not necessarily want to conform to the patterns of the past. This is true in regard to natural foods and as it regards

the unpasteurized milk, and if they are willing to pay the price we should leave them the option. The true hazards, in my professional judgment, are extremely remote when you have control on the animal, processing, etc." (end quote, Dr. Ravenholt).

Thus, our Clark County Health Officer has indicated that there would be little hazard, providing there is close control of the production and the product. This is specifically what AB 888 requests.

At that same hearing in Sparks, the State Board of Health was questioned regarding the present practices being followed, as well as the proposed changes. Under these practices, it is possible for a dairy to produce contaminated milk for an extended period of time (90 days) and still be permitted to market it. Additional changes were made in the application of existing regulations by the State Board of Health.

Specifically, under former regulations designed to safeguard the public, milk from infected cows, or cows being treated on antibiotics, had to be specially handled and then thrown away. The new regulation eased these rules and were adopted by the Board of Health.

Other safeguards were also dumped by the State Board of Health. In practice, the rules for eliminating unsafe milk from the market are not followed. The general procedure is that the State Board of Health must have 3 out of 5 failures on bacterial counts before they will remove a product from sale. In addition, the State, by its own admissions, does not follow its own regulations. There is a specified period of time and at least 2 tests that must be made before the product is allowed to be placed back on the market. However, by admission of Mr. Rosequist, milk inspector for Clark County, and in conversation with a Health Officer in Carson City, it is apparent that this regulation is not being followed by the State Health Department.

Rather than to require the 2 tests necessary to allow the product back on the market, the State Health Department permits immediate resumption by the producer after one test is made. In other words, they are allowing the producer to market milk illegally. They feel that the rules are unfair

to the producer and that it is too costly. We seriously question this practice. Rather than have the consumer purchase contaminated milk, and to allow this testing for contamination to extend to a period of three months, we feel that the producer should be restricted immediately. Note that AB 888 would require unpasteurized products to be removed immediately once the product has failed state regulations.

On January 17th of this year, at the request of the Consumers League, the County Health Department conducted a test on a raw goat milk product. The standard plate count on that product was less than 3,000 per milliliter, which is actually well within the limits of regulations for pasteurized products. The coliform count was less than one per milliliter, again well within the limits. This product far exceeded the safety standards and quality of any of the other products which large producers are marketing and, in fact, exceeds the quality of the pasteurized milk regulations.

At that same hearing in Sparks, in May, 1972, Dr. Ravenholt stated that in the south the state has had an influx on non-nationals in the milk service industry from backgrounds that might bring in health problems. What Dr. Ravenholt was specifically referring to was the health card permits that the State Board of Health no longer requires for milk handlers. This was another change in the regulations. The change was reportedly brought about because the cost for the health cards, that is, the testing, did not warrant the expense. Notice here that the Board of Health took the position of the producers; that is, we should eliminate the procedure because of cost, despite the fact that it might be hazardous to do so. But, on the other hand, regarding raw milk, the Board took an opposite position. As quoted on Page 8 of the minutes, "If there is a question or a doubt as to whether raw milk would be safe it should not be allowed."

Why the hypocrisy on the part of health? they are questioning the safety of raw milk but they are not questioning the potential health problems with the handlers where, even from Dr. Ravenholt there was a question and doubts as to their background and their health. Why do they not take the same position and insist that the handler be examined for health hazards?

In summary, gentlemen, the Board of Health has taken a position that cannot be defended. On the one hand they say that it would cost the producer too much for the food handlers v certificate, and therefore regulations should be eased; on the other hand, they eliminate the requirement for handlers and for abnormal milk, which is certainly a danger to the public, as it has either come from infected cows or cows on antibiotics. Their position endangers the public as there is no adequate way ~~to control the product themselves~~ they can control the products themselves.

This is a strange position for the Board of Health to take since their main function is to protect the consumer. Obviously they are taking a position of protecting the producer, but now they are in a position of opposing some products on the basis that they endanger the public. AB 888 provides for adequate testing methods, weekly inspections, and inspections of the plants themselves.

They continually express the opinion that it would be too costly and that they do not have the funding to provide adequate safeguards for the public, and thus ignore the regulations and ignore requests from the consumer.

At the present time, we know of only 2 or 3 very small producers who would even be interested in marketing this high quality product. (raw milk). Therefore, any excuses by the State Board of Health regarding excessive testing or inspections must be disregarded. However, passage of AB 888 will do a great deal to improve milk quality standards for all consumers in Nevada.

The State Board of Health is ignoring its responsibilities and insisting that there really is no problem. Obviously, products with high bacterial counts will continue to be marketed by producers, since the philosophy of the State Health Department seems to be that, since they cannot adequately work with the problem, it is better to ignore it.

We therefore request that the committee support AB 888 in that complete safety provisions for the public are provided for in the bill. The only thing lacking now would be adequate protection by the State Board of Health and the State Health Department.

THE EFFECT OF HEAT-PROCESSED FOODS AND METABOLIZED VITAMIN D MILK ON THE DENTOFACIAL STRUCTURES OF EXPERIMENTAL ANIMALS

FRANCIS M. POTTENGER, JR., M.D., F.A.C.P., MONROVIA, CALIF.

WE PERFORMED a feeding experiment with cats in our laboratory a few years ago to determine the effect of heat-treated foods upon growth and development. This experiment stemmed from the fact that we suffered steady mortality among the cats on which we were performing adrenalectomies for the purpose of standardizing adrenal cortical material. We were feeding these animals the meat scraps from the Sanatorium, together with raw milk and cod-liver oil. The cats were poor operative risks although our technique was good. In time, more cats had been given to us than we were able to feed on the scraps from the Sanatorium. We placed an order for raw-meat scraps at the market where the Sanatorium meats were bought; these scraps included muscle, bone, and viscera. This raw meat was fed each day to the same group of cats. Within a very short time the cats in those pens survived the operations, the unoperated cats appeared to be in better health, and the kittens born were vigorous. The contrast in apparent health between the cats in the pens fed on raw-meat scraps and those fed on the cooked-meat scraps was so startling that we decided to do a feeding experiment.¹⁻³

The cats were kept in open-air pens with a yard 4 feet wide, 7 feet high, and 12 feet long, one end having a roof, and a floor with bedding.

A routine procedure was followed with all cats. They were weighed, numbered, and described. In the case of donated cats, all possible information was obtained from donors regarding the history of development and the type of food the cat had received before being placed in our pens. Clinical notes, including weights, were kept. Each kitten was described and weighed on the day of birth, giving parentage, behavior of the mother during the birth, and other pertinent data, and clinical notes continued on all viable kittens. In the case of death an autopsy was performed, cataloguing gross and microscopic findings. Calcium and phosphorus determinations were done on the femur. At the close of the experiment, which ran for ten years, all remaining animals were autopsied.

In the first series of experiments, one group of cats was fed a diet of two-thirds raw meat, one-third raw milk, and cod-liver oil. The second group was fed a diet of two-thirds cooked meat, one-third raw milk, and cod-liver oil. Within the ten-year period, approximately nine hundred cats were studied,

Read before the Second Annual Seminar for the Study and Practice of Dental Medicine, The Desert Inn, Palm Springs, California, Oct. 9, 1945.

accumulated is large. In this paper only the general resume of predominant findings is presented.

The cats receiving raw meat and raw milk (Figs. 1 and 2) reproduced in homogeneity from one generation to the next. Abortion was uncommon, litters averaged five, and the mother cats nursed their young in a normal manner. The cats in these pens had good resistance to vermin, infections, and parasites. They possessed excellent equilibrium; they behaved in a predictable manner. Their organic development was complete and functioned normally.

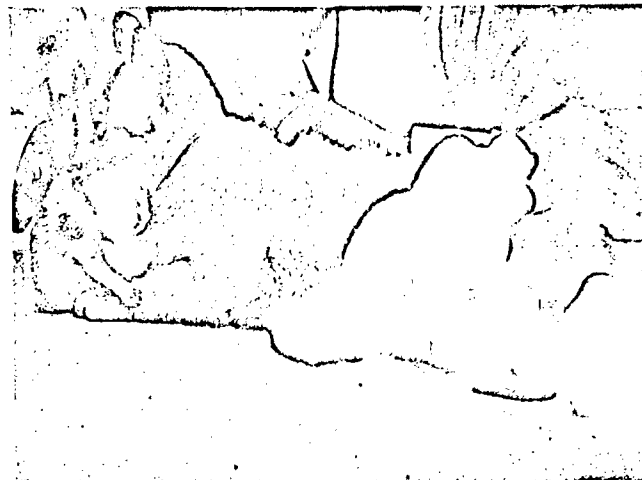


Fig. 1.—Adult female cat, one year old, on raw meat and milk. First litter in pens, 1936. Four kittens, 4 days old. Note full development and activity of kittens. Note smoothness and luster of fur. Inactive kitten second from left is kitten of cat 524.

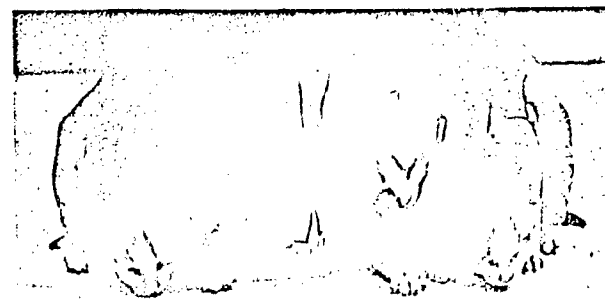


Fig. 2.—Four kittens of cat in Fig. 1, 1936 litter, 4 days old, and one living kitten (second from left) of cat 524. Note superior facial and bodily development of the raw-meat kittens.

Cats receiving the cooked-meat scraps (Fig. 3) reproduced a heterogeneous strain of kittens, each kitten of the litter being different in skeletal pattern. Abortion in these cats was common, running about 25 per cent in the first generation to about 70 per cent in the second generation. Deliveries were in general difficult, many cats dying in labor. Mortality rates of the kittens were high, frequently due to the failure of the mother to lactate (Fig. 4). The

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kittens were often too frail to nurse. At times the mother would steadily decline in health following the birth of the kittens, dying from some obscure tissue exhaustion about three months after delivery. Others experienced increasing difficulty with subsequent pregnancies. Some failed to become pregnant. For all breeding purposes, except special studies not reported here, we used a normal, raw-meat-fed male of proved fecundity, thus eliminating the possibility of male sterility.



Fig. 3.—Adult female cat 524. On cooked meat and raw milk for six months and during pregnancy, 1936 litter. Note dull eyes, poor fur. Three kittens, 4 days old, dead. Living kitten shown on Figs. 1 and 2.

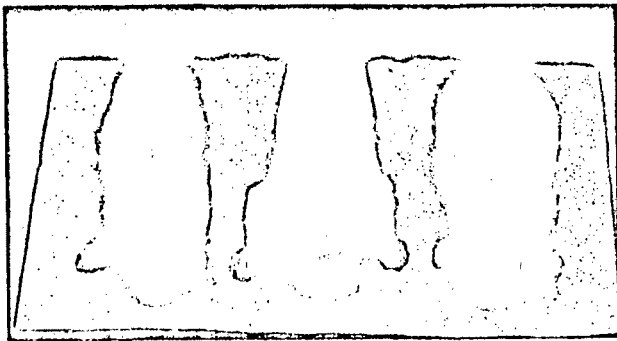


Fig. 4.—Three dead kittens, 4 days old, of cat 524, 1936 litter. Note poor fur and general development.

Cooked-meat-fed cats were irritable. The females were dangerous to handle, occasionally viciously biting the keeper. The males were more docile, often to the point of being unaggressive. Sex interest was slack or perverted. Vermin and intestinal parasites abounded. Skin lesions and allergies were frequent, being progressively worse from one generation to the next. Pneumonia and empyema were among the principal causes of natural death among the adult cats. Diarrhea, followed by pneumonia, took a heavy toll of the kit-

tens. Osteomyelitis was also both common and often fatal. Cardiac lesions, some ascertained clinically during life, were frequent. Hyperopia and myopia, thyroid disease, nephritis, hepatitis, orchitis, oophoritis, paralysis, meningitis, cystitis, arthritis, and many other degenerative lesions familiar in human medicine were observed.

Of the cats maintained entirely on the cooked-meat diet, with raw milk, the kittens of the third generation (Figs. 5 and 6) were so degenerated that none of them survived the sixth month of life, thereby terminating the strain.

One group of cats was fed first on raw meat, then placed on a cooked-meat diet for six months, and then returned to a raw-meat diet. When females of this group became pregnant, their kittens suffered some of the afore-mentioned stigmas, although the females themselves appeared to be in good health. Their succeeding litters would show irregularities that tended to lessen in intensity for the first two or three years, and then to increase again. The generations following improved as long as they received the raw-meat diet. Their resistance to disease, greatly diminished when the cooked-meat diet was administered, gradually improved upon their return to the raw-meat diet. They would partially maintain their skeletal form, but their calcification would continue to diminish (Figs. 7 and 8). Their reproductive efficiency would be injured from the standpoint of the size and vitality of their kittens, and was particularly noticeable in the failure of the subsequent litters to conform to a homogeneous pattern.

Cats of the first and second generation cooked-meat-fed groups were returned to a raw-meat diet. These were classified as "regenerating" animals of the first and second order, first, second, third, and fourth generations.

It apparently requires four generations for either order to regenerate. However, because of lack of reproductive efficiency, it is only the occasional animal that returns to the normal homogeneous pattern noted before deficiency was imposed on the strain of cats. Improvement in resistance to disease is noted in the second generation regenerating cat. Allergic manifestations persist. Reproduction is erratic. In the third generation regenerating animal, skeletal and soft tissue changes are still noticeable to a lesser degree. In the fourth generation, the occasional animal appears to have returned to normal skeletal and tissue form.

At autopsy, cooked-meat-fed females frequently presented the picture of ovarian atrophy and uterine congestion, whereas the males often showed failure in the development of active spermatogenesis. The long bones tended to increase in length in these animals, while diminishing in diameter. It was common to find the hind legs increasing in length over the forelegs. The trabeculation of the bones became coarser and showed evidence of less calcium (Fig. 9). In the third generation of cooked-meat-fed animals, some of the bones became as soft as rubber and a true condition of osteogenesis imperfecta was present (Figs. 10 and 11).

In the cooked-meat-fed animals, visceral volume decreased, which was evident from the size of the thoracic and abdominal cavities. However, the males on the sweetened condensed milk were overly fat and showed distended abdominal cavities.

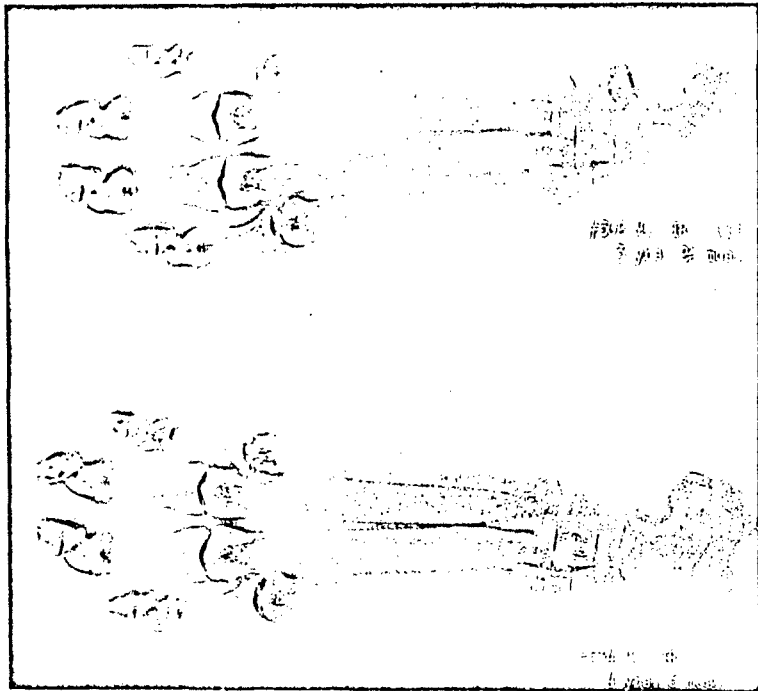


Fig. 9.—X-rays of hind feet of male cats 502 and 534. Cat 502 was the son of male cat 534 and female cat 524. Mother (524) had been subjected to cooked meat diet in 1936. Her kitten (502) was one of the third litter after cat 524 was returned to raw-meat diet. Cat 502 was raised on raw meat. Note coarse trabeculation of the bones of cat 502 when compared with the same structures in the father. Trabecular pattern of mother's foot was slightly coarser than that of the father.

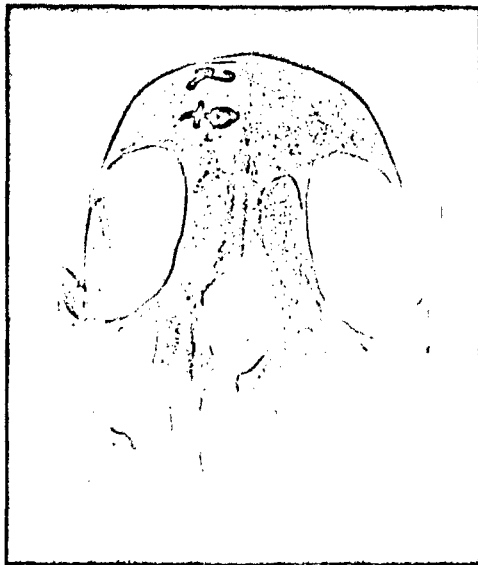


Fig. 10.—Skull of female kitten, aged 3 months, 3 weeks. Regenerating first order, second litter. Ca 1.25; P 1.64 of femur. Note that skull is complete except for orbital area.

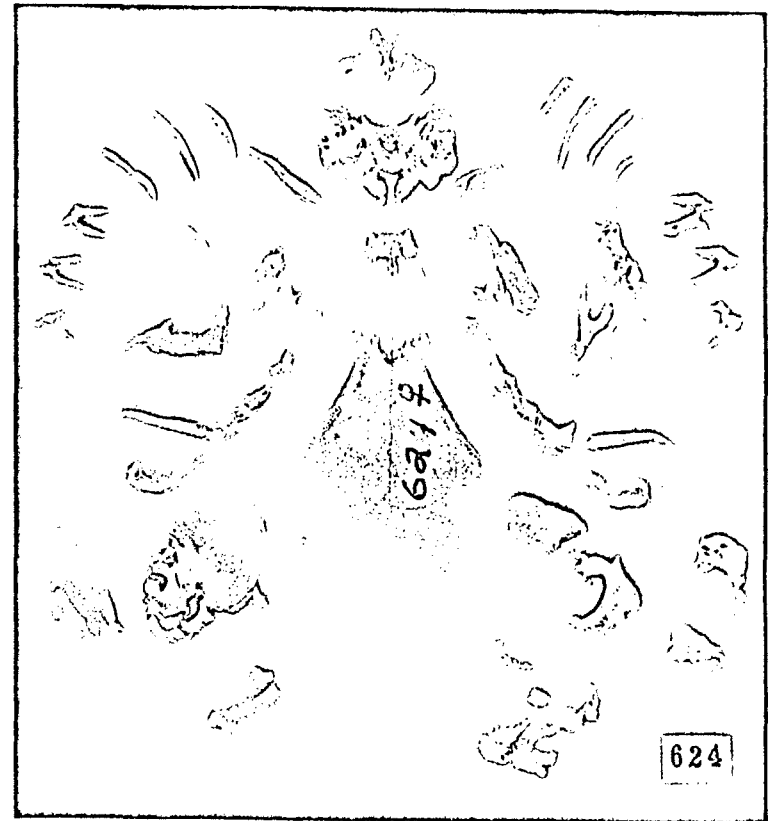


Fig. 11.—Skull of third generation, first litter cooked-meat female kitten, aged 5 months, 3 weeks. Ca 1.86; P 0.639. Note how skull falls apart at suture lines.

Before I describe the dental conditions that obtained in the cats on the raw- and cooked-meat diets, I wish to state briefly that we did three other series of feeding experiments. In these series we used the following kinds of milk: raw milk, raw metabolized vitamin D milk, pasteurized milk, evaporated milk, and sweetened condensed milk (Figs. 12, 13, 14 and 15). Roughly, our results corresponded with those of the previous experiments; animals on raw milk and raw meat reproduced a homogeneous strain, the usual causes of natural death being old age or injuries from fighting.

The male cats fed on metabolized vitamin D milk (from cattle fed irradiated yeast) and raw meat showed osseous disturbances very like those on pasteurized milk, while the female seemed unaffected. However, an interesting circumstance occurred in the males fed on this milk. Young males did not live beyond the second month, and adult males died within ten months. The most notable fact was that there is a tendency for the calcium phosphorus ratio to become unbalanced, approaching 2.5 to 1, as compared with a normal of 2 to 1. (Tables I, II, and III.) This was accompanied by osseous changes, including the development of osteitis in certain of the young animals. As was

TABLE I. LONGEVITY OF IRRADIATED VITAMIN D MILK-FED CATS

(Four litter-mate, well-developed raw-meat male kittens, age 1½ months, were placed on two metabolized vitamin D milks—one from a certified farm where the cattle received green feed, and the other where cattle received dry feed. Note that the dry-feed-fed cattle gave milk which produced rickets when fed to cats, in spite of high amount of vitamin D present. The vitamin D irradiated milk was the sole source of food)

| | DIET | RICKETS | FIRST AND LAST WEIGHT | WEIGHT CHANGE | CALCIUM AND PHOSPHORUS RATIO | DATE AND CAUSE OF DEATH |
|------------|----------------------------|---------|-----------------------|---------------|------------------------------|---------------------------|
| Female 359 | Raw meat control | 0 | 605 1,445 | +840 | (2) Ca 13.27 P 6.72 | Chloroformed 6/24/36 |
| Male 360 | Green feed, vitamin D milk | 0 | 620 540 | - 80 | (191) Ca 15.52 P 8.12 | Pneumonia 6/16/36 |
| Male 361 | Green feed, vitamin D milk | 0 | 580 501 | - 79 | (202) Ca 15.86 P 7.85 | Pneumonia 6/16/36 |
| Male 362 | Dry feed, vitamin D milk | Present | 640 506 | -134 | (205) Ca 15.60 P 7.61 | Pneumonia 6/15/36 |
| Male 263 | Dry feed, vitamin D milk | Present | 700 537 | -163 | (216) Ca 17.71 P 7.27 | Severe Rickets 6/15/36 |

Litter mates born March 1, 1936.
Experiment started April 15, 1936.
Milk was sole diet.

pointed out by Becks⁴ in his experimental work with dogs, natural cod-liver oil did not appear to bother the cat.

The cats fed pasteurized milk as their principal item of diet, and raw meat as a partial diet, showed lessened reproductive efficiency in the females, and some skeletal changes, while the kittens presented deficiencies in development. Cats fed evaporated milk showed even more damage. However, the most marked deficiencies occurred in the sweetened condensed milk fed cats. We believe that the excessive carbohydrate in this milk was responsible for much of this heavy damage.

Later, we made a comparative study of several types of milk on white rats,⁵ the general results of which coincided with those found in the cats. Among the findings is the change in trabeculation of the bones, which was well demonstrated in the elbow (Figs. 16A, 16B, and 16C).

Of particular interest are the dental structures of these animals (Figs. 17A, 17B, 17C, 18A, 18B, 18C, 19A, 19B, and 19C). The cats fed on the raw-meat diet from generation to generation maintained a regular, broad face with prominent malar and orbital arches, adequate nasal cavities, broad dental arches and regular dentition. The configuration of the female skull is distinct and different from the male, and each maintained the normal outlines. The membranes were firm and of a good pink color, with no evidence of infection or degenerative change. In older cats, particularly the males that had engaged in much fighting, the incisors had often been lost; but in raw-meat-fed cats of raw-meat-fed ancestry, gingivitis or paradentosis was seldom seen.

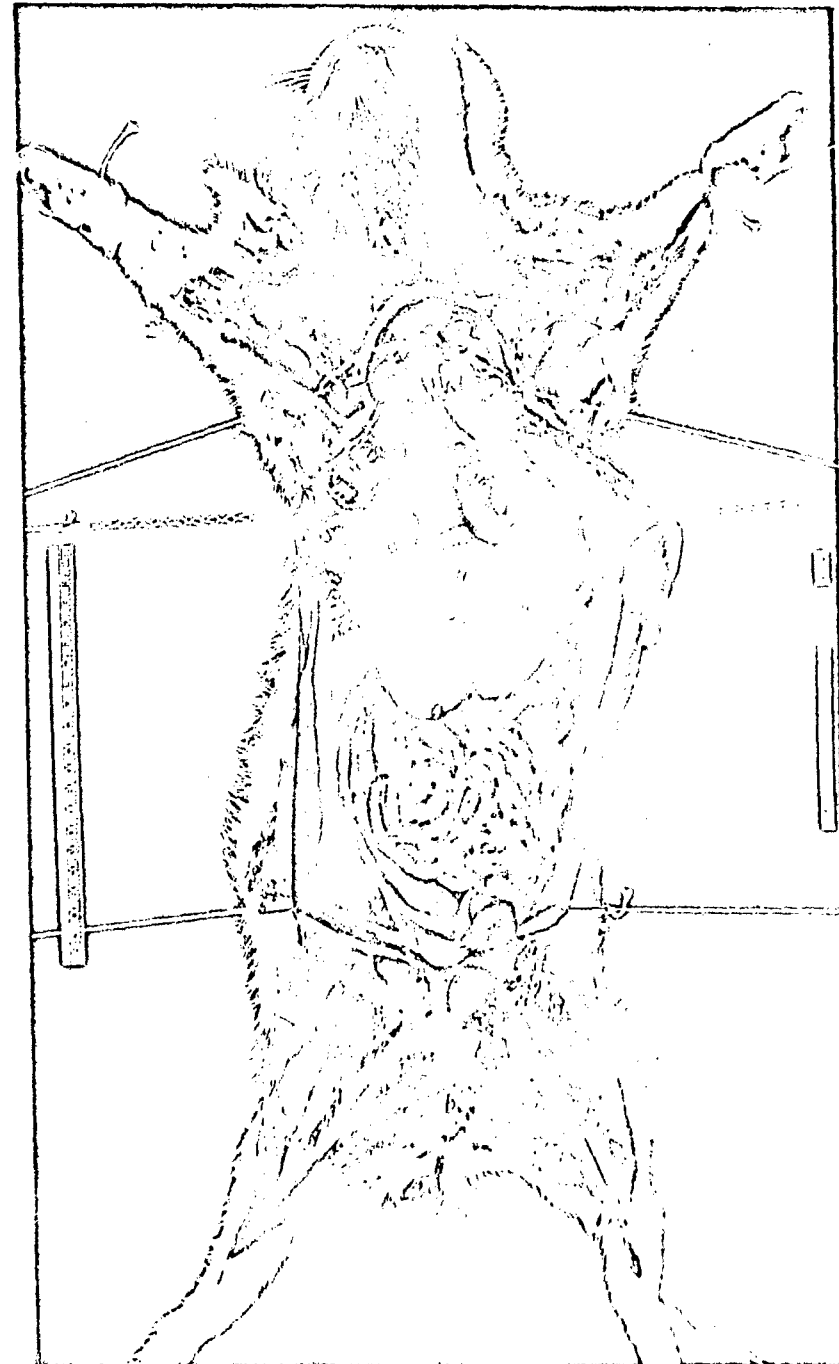


Fig. 12.—Internal organs of female cat 33, fed a diet of one-third raw meat and two-thirds raw milk. Note excellent condition of fur and creamy yellow subcutaneous tissue with

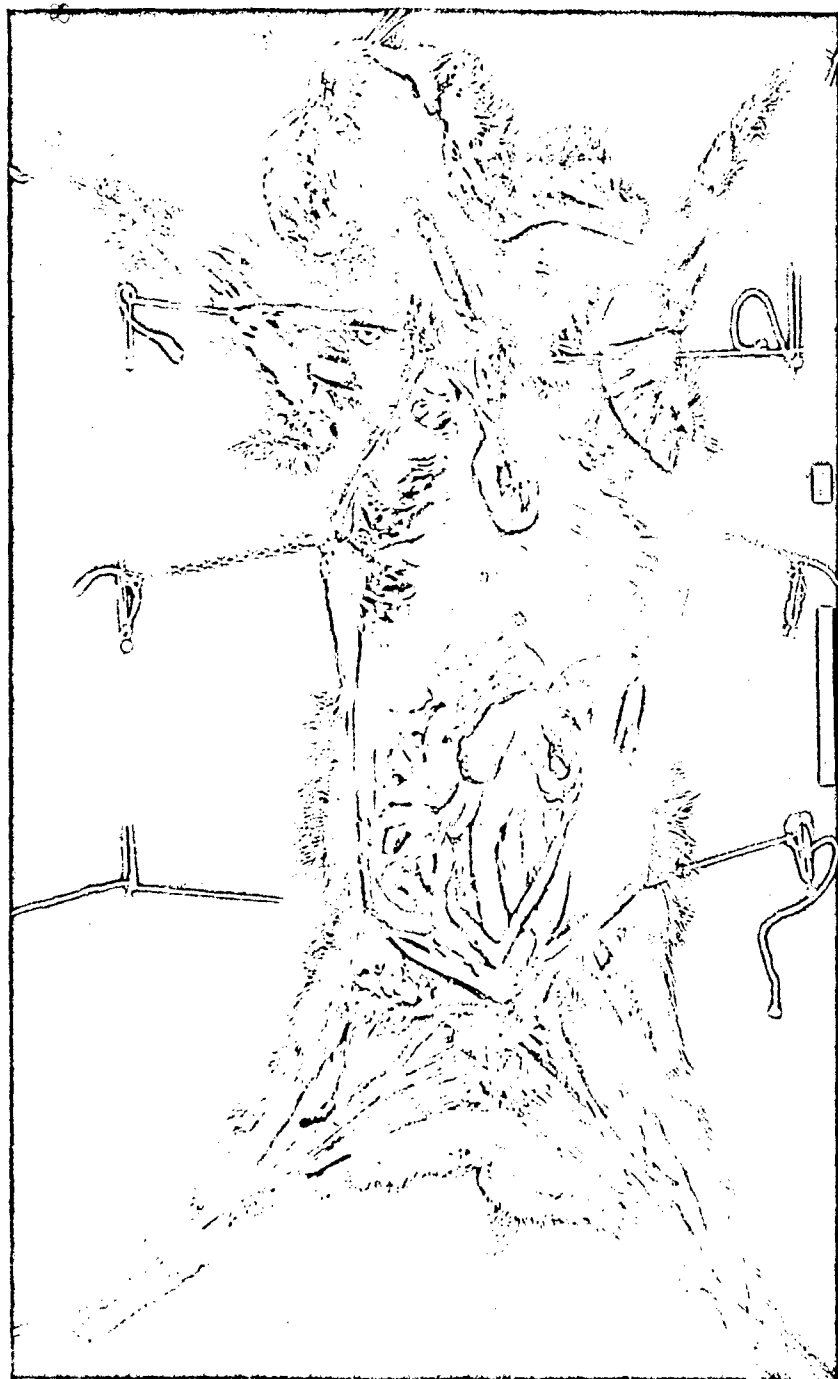


FIG. 15.—Internal organs of female cat 506, fed sweetened condensed milk and raw meat. Note extreme coarseness of fur and marked purple vasomotor disturbance of skin. Failure of lungs to collapse. Enlargement of liver and spleen. Chronic passive congestion. Lack of intestinal tone. Marked engorgement of uterus.

TABLE II. MILK EXPERIMENT NUMBER IV

(Experiment to study effect of heat-processed milk in the development and longevity of cats fed one-third enough raw meat to maintain them and two-thirds the amount of food from milk. Note that the animals on the metabolized vitamin D milk diet died within two months, while most litter mates survived the entire experiment. Start of experiment, Dec. 12, 1940; close of experiment, Aug. 13, 1941 [8 months])

| NUMBER AND ORDER | AGE AT BEGINNING OF EXPERIMENT | LENGTH OF LIFE AFTER EXPERIMENT BEGAN |
|-----------------------------------|--------------------------------|---------------------------------------|
| <i>Male</i> | | |
| <i>Condensed Milk</i> | | |
| *788 1 Re L1 | 9½ months | 8 months |
| 749 1 Re L3 | 7½ months | 3 months |
| 757 1 Re L3 | 7½ months | 8 months |
| <i>Female</i> | | |
| 644 Re | Adult | 4½ months |
| 648 1 Re L1 | 1 year 7 months | 4½ months |
| 506 Re | 2 years 6 months | 8 months |
| <i>Male</i> | | |
| <i>Evaporated Milk</i> | | |
| 789 1 Re L1 | 9½ months | 8 months |
| 750 1 Re L3 | 7½ months | 4½ months |
| 760 1 Re L3 | 7½ months | 8 months |
| <i>Female</i> | | |
| 794 Re | Adult | 4½ months |
| 693 1 Re L1 | 2 years | 8 months |
| 678 1 Re L2 | 1 year 4 months | 5¾ months |
| <i>Male</i> | | |
| <i>Pasteurized Milk</i> | | |
| 790 1 Re L1 | 9½ months | 8 months |
| 752 1 Re L3 | 7½ months | 2 months |
| 761 1 Re L3 | 7½ months | 8 months |
| <i>Female</i> | | |
| 691 Re | 2 years | 8 months |
| 569 1 Re L1 | 1 year 8 months | 2½ months |
| 532 Re | 3 years | 8 months |
| <i>Male</i> | | |
| <i>Metabolized Vitamin D Milk</i> | | |
| 792 1 Re L1 | 9½ months | 1 month 22 days |
| 753 1 Re L3 | 7½ months | 1 month 16 days |
| 763 1 Re L3 | 7½ months | 1 month 11 days |
| <i>Female</i> | | |
| 533 Re | 4 years | 8 months |
| 697 1 Re L1 | 1½ years | 8 months |
| 694 Re | 5½ years | 8 months |

Males 788, 789, 790, 792—litter mates.

Males 749, 750, 752, 753—litter mates.

Males 757, 760, 761, 763—litter mates.

*Explanation: 1 = First generation; Re = regenerating; L1 = first litter. Example: 1 Re L1 = First generation, regenerating, first litter. It is the first generation raw-meat animal, born to a cat after it had been on a cooked-meat diet.

Adult cats placed on a cooked-meat diet begin to show unhealthy conditions in the mouth within three to six months. A pregnant cat will show the change more quickly. These cats first present gingivitis, then diminished calcium, paradentosis, abscesses, and finally, some shedding of the teeth. The canine is the last tooth to be shed.

Caries did not develop in cats fed on any of the diets.

In the second generation of the cooked-meat cats the newborn deficient animal shows an irregular development of the contours of the skull cap and a narrowing of the malar and orbital arches, the latter becoming incomplete as deficiency progresses. Like the configuration of the mandible and

TABLE III. MILK EXPERIMENT NUMBER III

(In addition to the regular diet, each cat daily received approximately 15 mg. iron, 0.16 mg. copper, and 0.016 mg. manganese. Note the shortness of life of the metabolized vitamin D milk-fed males on the sole diet of milk)

| NUMBER AND ORDER | AGE AT BEGINNING OF EXPERIMENT | LENGTH OF LIFE AFTER EXPERIMENT BEGAN | CALCIUM AND PHOSPHORUS RATIO | AVERAGE LENGTH OF LIFE |
|-----------------------------------|--------------------------------|---------------------------------------|------------------------------|------------------------|
| <i>Metabolized Vitamin D Milk</i> | | | | |
| <i>Male</i> | | | | |
| *512 2C1 | 2 years 7 months | 5 months | 2.43 | 3 months |
| 514 2C2 | 2 years 4 months | 10 months | 2.08 | 4 days |
| 1594 2 Re L1 | 7 months 3 weeks | 1 month 3 weeks | 2.72 | |
| 620 1 Re L1 | 7 months | 2 months | 2.27 | |
| 651 Re | 9 months | 2 months 2 weeks | 2.74 | |
| 654 Re | 5½ months | 1 month 10 days | 2.11 | |
| 661 Re | 6 months | 1 month 19 days | 2.36 | |
| 674 Re | Lost | | | |
| <i>Female</i> | | | | |
| 519 1C | 3 years 6 months | 3 months 1 week | 3.00 | 4 months |
| 586 1 Re L2 | 8 months | 2 months 1 week | 3.20 | 1 day |
| 609 Re | Adult | 8 months | 2.69 | |
| 682 Re | 7½ months | 3 months 1 week | 2.22 | |
| <i>Pasteurized Milk</i> | | | | |
| <i>Male</i> | | | | |
| 511 2C1 | 2 years 6 months | 3 months 12 days | 2.19 | 4 months |
| 515 2C2 | 2 years 5 months | 10 months 1 week | 2.23 | 11 days |
| 531 2 Re L1 | 2 years 8 months | 5 months | 2.09 | |
| 589 Re | 1 year 6 months | 5 months | 2.31 | |
| 592 2 Re L1 | 6½ months | 2 weeks | 2.13 | |
| 618 1 Re L1 | 7½ months | 2 months 1 week | 3.00 | |
| 658 Re | 6½ months | 2 months 14 days | 4.70 | |
| 660 Re | 6 months | 1 month 11 days | 2.31 | |
| <i>Female</i> | | | | |
| 518 1C | 3 years 8 months | 4 months | 2.33 | 3 months |
| 521 R | 2 years 4 months | 2 months 3 days | 2.38 | 27 days |
| 566 Re | 2 years 4 months | 10 months 1 week | 2.36 | |
| 584 1 Re L2 | 8 months | 2 months | 2.18 | |
| 655 Re | 5 months | 1 month 7 days | 2.11 | |

*2C1 = Second generation, cooked-meat-fed animal, first litter.
 †2 Re L1 = Second generation, regenerating animal, first litter.

maxilla is altered. As the kitten grows and develops, these abnormalities become more prominent. The eruption of the teeth is frequently followed by bleeding gums and prostration. Even the deciduous teeth are irregular in size and shape and are apt to be delayed in shedding. Supernumerary and missing teeth are common. Teeth do not erupt at a regular time as they do in the raw-meat-fed cat. Most of the cooked-meat-fed cats show a longer and narrower face with a retraction in the middle third. There is frequently a recessive mandible or a protruding mandible.

The permanent teeth are, in general, more irregular in size and alignment than the deciduous teeth. Gingivitis persists, gums become spongy, and abscesses gradually develop. It is through this process of secondary infection that most cats on a cooked-meat diet lose their teeth (Figs. 20A, 20B, and 20C). One of the most interesting factors is that the teeth in the second generation cooked-meat and regenerating cats frequently showed root resorption (Figs. 18A, 18B, and 18C). Becks⁴ has suggested thyroid deficiency as a cause of root resorption. Although thyroid deficiency is sometimes demonstrated in

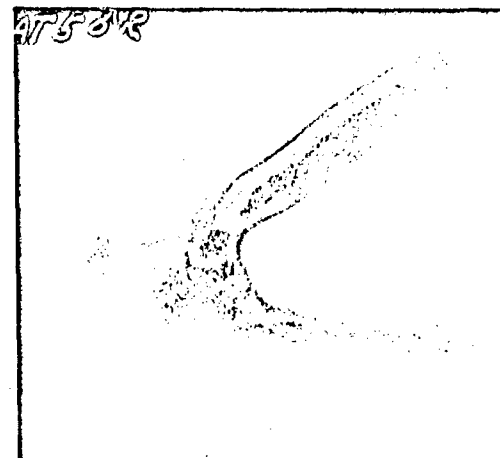


Fig. 16A.



Fig. 16B.



Fig. 16C.

Fig. 16A.—Elbow of male rat 5, fed on raw milk. Note advanced maturity, greater diameter and length of olecranon process of the ulna and finer internal trabeculation, as compared with Figs. 16B and 16C. All rats fed on milk from the same milkings.

Fig. 16B.—Elbow of male rat 9, fed on pasteurized milk. Note smaller olecranon process and delayed maturity when compared with rat 5.

Fig. 16C.—Elbow of male rat 11, fed on milk boiled five minutes. Note much coarser internal trabeculation of the olecranon process than in either Fig. 16A or Fig. 16B. Smaller in diameter, shorter in length.

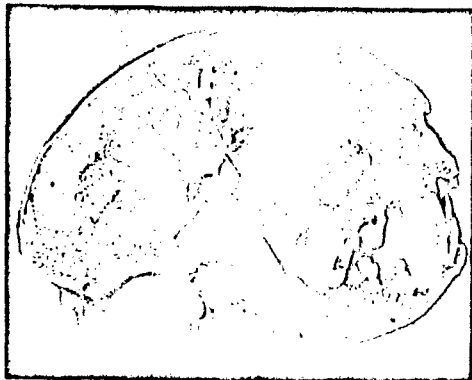


Fig. 17A.—Lateral photograph of the skull of cat 539, primarily a raw-meat-fed animal that had had a short period of time (less than six months) on a cooked-meat diet. Note healed portion of alveolar processes around teeth previously damaged by the cooked-meat diet. Well-developed condyle places lower border parallel with upper jaw.

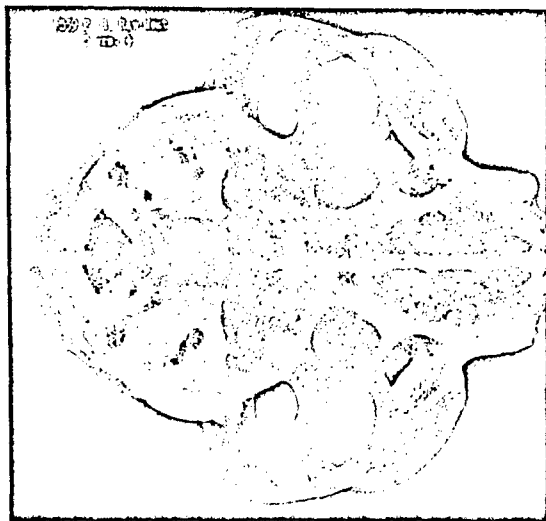


Fig. 17B.—Base of skull of cat 539, showing well-developed malar and orbital arches. Fair trabeculation.

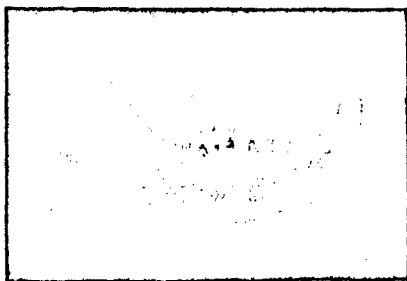


Fig. 17C.—Lateral x-ray of half jaw of cat 539, showing a normal jaw structure, good distribution of trabeculae, well-developed condyle, and well-developed pterygoid process of the mandible. Alveolar crest of normal height; even distribution of teeth.

these animals, it is by no means constant. However, they all received a diet of denatured proteins which may play an important part in root resorption as well as chronic infections and disturbances in mineral metabolism. Loss of teeth in the deficient animal has come about as a result of parodontitis. Loss of vertical trabeculation and erosion of the alveolar processes occur in these animals.

It is interesting to note that root resorption occurred more commonly among the cats fed a diet of heat-processed milk than among those receiving cooked meat.

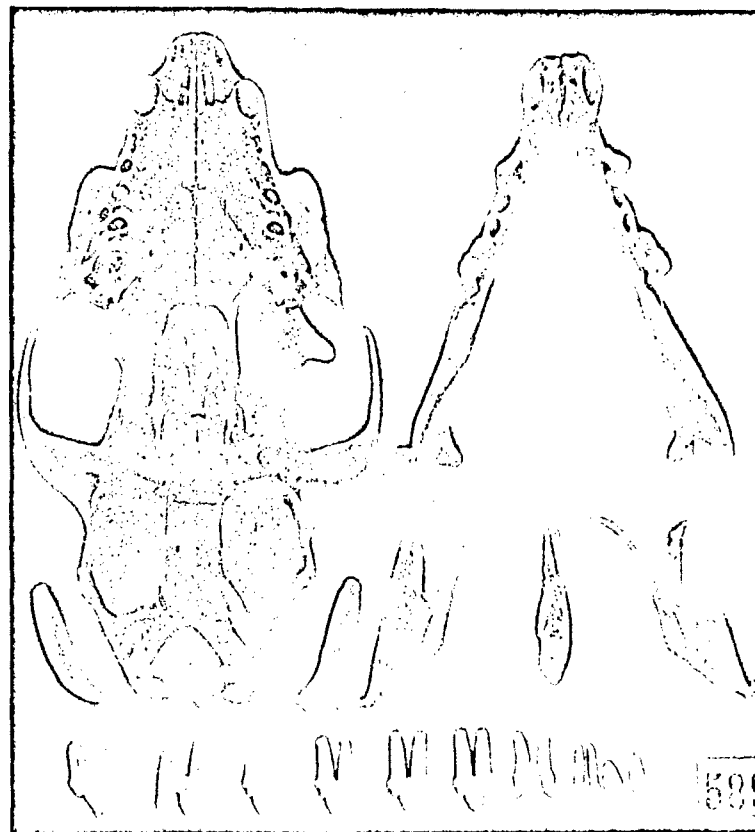


Fig. 18A.—Regenerating male cat 589 on raw meat until 1 year, 2 months of age, following which he was on pasteurized milk experiment for four months. Note missing teeth, chalky appearance of bone, squaring off of bases of teeth and marked root resorption. Osteoporosis. Lack of completion of orbital arches. Malar bones have become separated at suture lines.

The degenerative changes in the skull and mouth grew more pronounced in the third generation cooked-meat cats (Figs. 10 and 11). The bones were very fine, with scarcely enough structure to hold the skull together. The teeth were smaller and much more irregular. When the permanent teeth erupted, the third generation cats were frequently prostrated.

In the regenerating cats, skull development is still deficient in the second generation, with a universal malalignment of teeth. The third generation

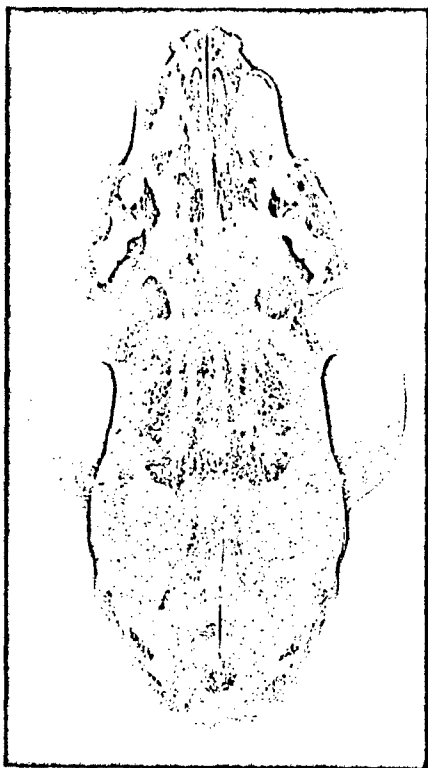


Fig. 18B.—X-ray of base of skull of regenerating male cat 589. Note lack of orbital and zygomatic arches and marked osteoporosis.

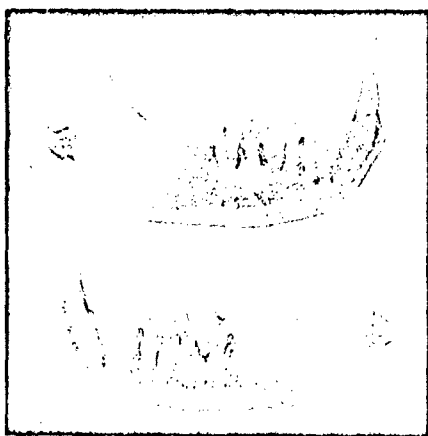


Fig. 18C.—X-ray of mandibles of regenerating male cat 589. Note marked osteoporosis and atrophy of the alveolar processes with small condyle head and poorly developed pterygoid process.

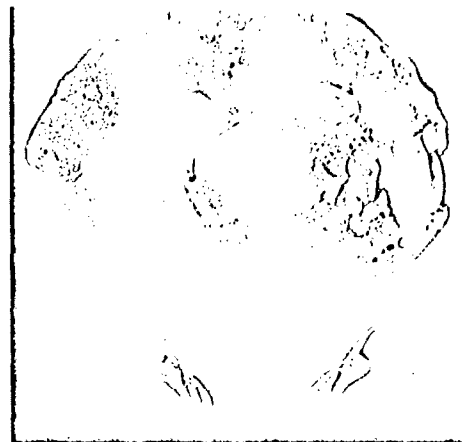


Fig. 19A.—First generation female cat 518, nursed one month, on a cooked-meat diet for three years, three months. She was then placed on the pasteurized milk experiment and died three months later. Note flattening of the entire skull with poor development of the condylar fossae. Distance from the zygomatic arch to the lower border of the mandible is lesser in the posterior jaw than the anterior in the region of the premolar teeth. Well-developed parodontosis with vertical atrophy. Poor distribution of trabeculae. Erosion of the condyle. Root resorption present in both upper and lower teeth.



Fig. 19B.—First generation female cat 518, 3 years, 7 months, as in Fig. 19A. Note partial resorption of orbital arches and poor structure of zygomatic arch. Evidence of osteoporosis. Poor distribution of trabeculae.

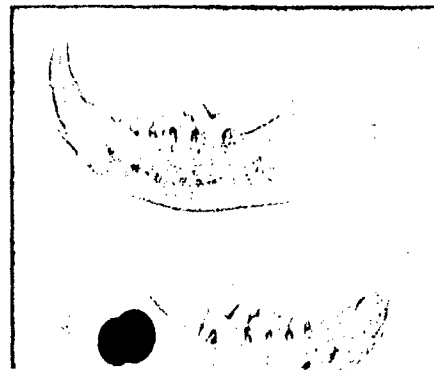




Fig. 20A.—Second generation male cat 513, second litter, cooked meat. Note apparently good skull except for incomplete orbital arch, resorption of the condyle, and the pulling up of the posterior portion of the mandible in comparison with the anterior portion.

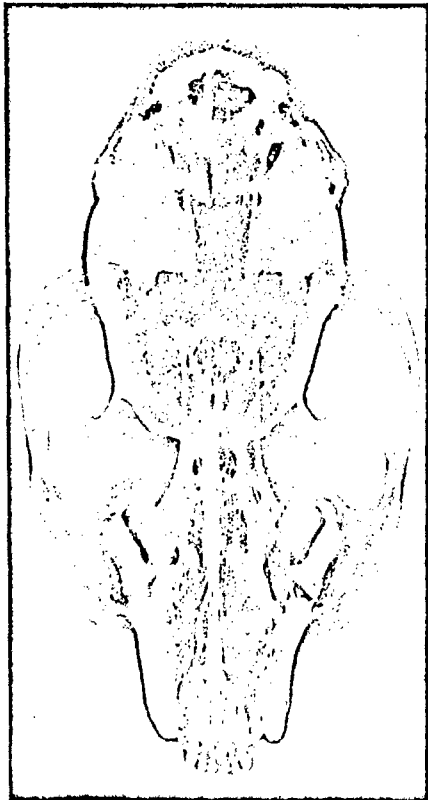
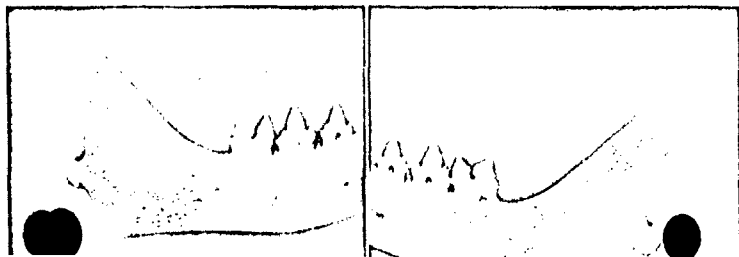


Fig. 20B.—X-ray of basal view of skull of second generation male cat 513, as in Fig. 20A. Note lack of development of orbital arch and osteoporosis.



regenerating cats show improvement, and in the fourth generation, an occasional cat will show normal skull and dental development.

After we performed these experiments, the pens in which all of these animals were housed lay fallow for several months. Weeds sprang up in each pen. The fact that the weeds grew so luxuriantly in the pen which housed the raw-meat and raw-milk-fed animals, as compared with those which grew in the other pens, led us to perform a further experiment. We planted two kinds of beans in each pen. The results of the soil-fertilizing effect of the milk-fed female cats is shown in Fig. 21, where *A*, *B*, *C*, and *D* indicate the relative growths of vegetation in pens formerly occupied by cats on the various milk diets.

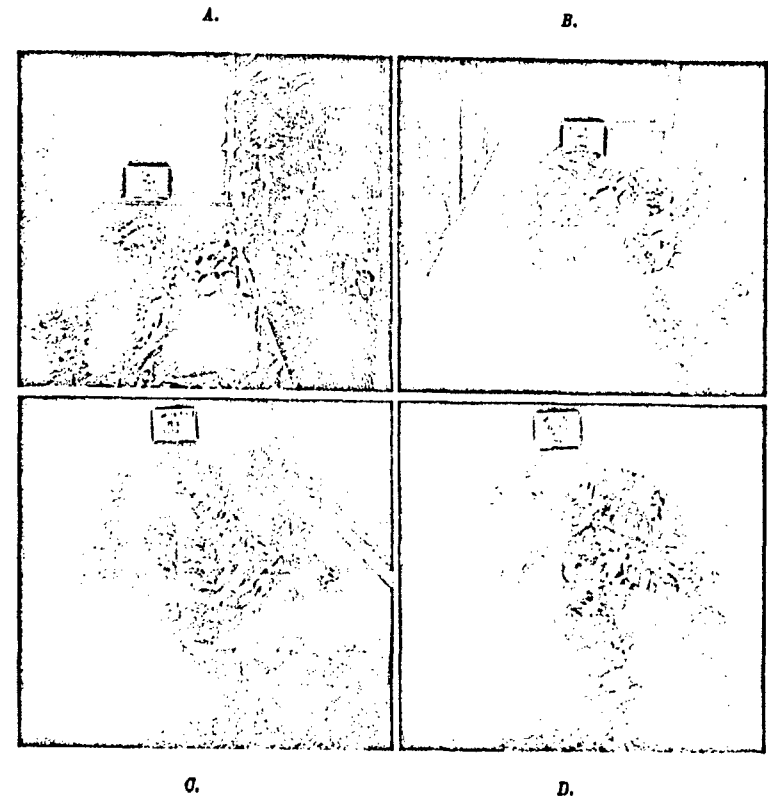


Fig. 21.—Beans planted in pens occupied by female cats shown in Figs. 12, 13, 14, and 15. *A*, Raw milk fed. *B*, Pasteurized milk fed. *C*, Evaporated milk fed. *D*, Sweetened condensed milk fed.

What vital elements were destroyed in the heat processing of the foods fed the cats? The precise factors are not known. Ordinary cooking precipitates proteins,^{7,8} rendering them less easily digested.⁹ Probably certain albuminoids and globulins are physiologically destroyed.^{7,10} All tissue enzymes are heat labile and would be materially reduced or destroyed. Vitamin C and some members of the B complex are injured by the process of cooking. Wulzen and Van Wagendonk¹¹ have described a thermolabile substance in milk that may be one of the factors. Minerals are rendered less soluble by

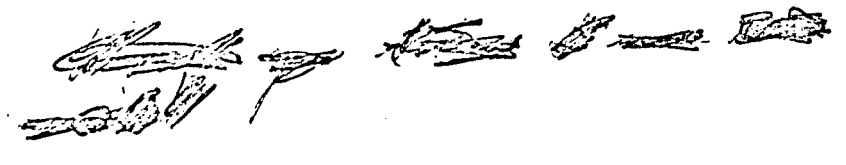
altering their physicochemical state.¹² It is possible that the alteration of the physicochemical state of the foods may be all that is necessary to render them imperfect foods for the maintenance of health. *It is our impression that the denaturing of proteins by heat is one factor responsible.*

The principles of growth and development are easily altered by heat and oxidation, which kill living cells at every stage of the life process, from the soil through the plant, and through the animal. Change is not only shown in the immediate generation, but as a germ plasm injury which manifests itself in subsequent generations of plants and animals.

I wish to thank those who have contributed to this work: Dr. Allison James of Los Angeles, who first brought the dental aspects of the experiments to my attention; Dr. J. E. Ziegler, of Los Angeles, who has assisted with the x-rays of the skulls; Dr. D. G. Simonsen, also of Los Angeles, who supervised the care of the animals and the compiling of records; and the Lee Foundation for Nutritional Research, of Milwaukee, which has contributed other valuable assistance in the preparation of the article.

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IV. REPORTS FROM STATES

A. California

Fatal Case of Salmonella dublin Infection Associated with Raw Certified Milk. Reported by Dr. Philip K. Condit, Chief, Communicable Diseases, California State Department of Public Health, Dr. Herbert H. Cowper, Chief, Acute Communicable Diseases Division, Los Angeles County Health Department, Dr. Edward Aaron, Senior Veterinarian, Los Angeles County Health Department, and Dr. George Perlstein, EIS Officer assigned to California State Department of Public Health.

A 25-year old female was admitted to the UCLA Medical Center in Los Angeles on September 14, 1964. A blood sample taken on that date for culture subsequently grew Salmonella dublin. Diagnosis on September 15, the date of death of the patient, included septicemia and acquired auto-immune hemolytic anemia. The hematologic disorder was a pre-existing one.

Epidemiologic investigation of the case revealed the patient to be a consumer of certified raw milk. The dairy implicated was surveyed to determine the status of the workers in regard to S. dublin. One male employee was found to be a shedder of the organism. A survey of the 1500 cow herd on an individual basis was not carried out, but it is of epidemiologic importance that in 1958 this same herd was implicated in a S. dublin outbreak. During this outbreak of 47 cases, 11 of which were laboratory confirmed, certified raw milk was implicated and a survey of the 387 cows at that time revealed 3 who were shedding S. dublin.¹

Editor's Comment: Salmonella dublin infections in cattle is a well recognized problem and one which has caused a great deal of worry and expense in recent years. It's presence in raw milk has been commented on frequently in the past and points out another danger of the consumption of raw milk.

In this particular case the patient had an auto-immune hemolytic anemia, a disorder which has been shown clinically and experimentally to predispose to salmonella infections.² The hypothesis has been advanced that phagocytosis of the cellular breakdown products by the reticuloendothelial cells saturates or impares the capacity of these cells to effectively combat pathogenic bacteria.

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SUGGESTED TESTIMONY

BEFORE NEVADA ASSEMBLY COMMITTEE ON AGRICULTURE
Carson City, Nevada
April 5, 1973

Safeway appreciates this opportunity to make known its views on AB 792 on the matter of dating dairy and bakery products. Because we carry some 10,000 items in our stores, it is relatively rare that we participate in a Legislative Hearing concerning a single food product. However, owing to the far-reaching consequences of this measure upon consumers, we believe it is timely and incumbent upon us to share with you our four decades of experience as both a processor and retailer of food products.

Most of our comments here will be directed towards dairy products because of their perishability and the need to date these products, but some of the essentials will apply equally to bakery products.

Since 1935, Safeway has been openly dating its fluid milk products with the date the product should be removed from the shelf. We do this because we believe that consumers are entitled to know the freshness of perishable products; and because of our own desire to insure proper rotation and to expedite movement of the perishables out of our stores. It's good quality control and its' good economics.

We are in agreement with the objectives of this Legislature to enhance the quality of milk distributed to consumers in this state. Perhaps you are aware that about four months ago, the Nevada Dairy Commission adopted a regulation requiring that dairy products be imprinted with the date the product should normally

Comments by Neil Holbrook

be removed from the shelf. This regulation is precisely the same as a law adopted in California two years ago.

However, to enact a law that will result in establishing a specified number of days of shelf life will, instead of creating higher sanitation, have the strange effect of reducing the quality of milk sold to Nevada consumers. It is probably the best possible way to standardize mediocrity and actually decrease the quality of milk. Moreover, it will cost consumers more money for their milk, a matter that cannot be overlooked in the face of rising food prices. Under such a law there is no incentive to process high quality milk with a long shelf life, as is presently the trend most everywhere in this nation. For example, we have recently constructed a milk plant that serves this very market in which plant we built a laminated airflow from the ceiling to the floor. The air is recycled and sterilized each time it enters the room where the milk is filled into the cartons. This processing method approaches nearly perfect aseptic packaging, and while the milk is not sterile, we are close to achieving this result. In fact, presently all of our whipping cream and half-and-half is sterilized and aseptically packaged.

If a law specifying the length of shelf life were adopted, there would be no incentive for processors to seek for a long shelf life product. Some processors could relax their quality control security with a short shelf life statute. In most of our milk plants, we print on our milk cartons pull-dates of about

Comments by Niel Holbrook

10 days after processing, and still publicly and openly guarantee the consumer seven days of wholesome product properly refrigerated in their home. What the consumer really wants, is the longest possible shelf life. A shelf life law geared towards the most unsanitary operator in the market would tend to pull high quality processors down to that level. Moreover, a nominal shelf life would mean that measurable quantities of outdated milk would be dumped down the sewer, a substantial factor that would increase the cost of dairy products.

It is common knowledge all over the dairy industry that temperature and not time is the major consideration for wholesome long shelf life of a pasteurized fluid milk product. Milk has excellent keeping quality at 45°F and below.

The trend in recent years all over the nation is towards the long shelf life product. Numerous sterilized milk plants have been built and are now being built to enable the use of ultra high heat processing and aseptic packaging. Safeway is now building every new plant with equipment to sterilize the air in the packaging room. If we so desired, although we are not doing so and we do not plan to do so, we could institute a pull-date of 18 to 20 days for the milk from our plant which supplies consumers in this market where we are today.

Recently the Maryland Legislature was considering a shelf life dating law with a specified number of days. Our own studies indicated that adoption of that proposed law would have increased our processing and distribution costs for the plant supplying that area by approximately \$.0543 per gallon

Comments by Neil Holbrook

over the existing cost. The higher cost would have been the result of numerous factors including, among others, more frequent deliveries to stores, lower volume per delivery, and dumping outdated milk. We also found that such a dating law would tend to decrease the availability of milk and per capita consumption. For example, store operators would tend to order lesser volumes so as to avoid dumping outdated milk, particularly on weekends.

Our study concerning the proposed Maryland law, which by the way did not pass, turned up an interesting wrinkle we had not anticipated. Passage of the law would have required additional unnecessary energy in the face of pending shortages of energy. For example, we found that our milk plant serving the Maryland stores would have to make an additional 160 deliveries per week. This would have resulted in consumption of 79,000 additional gallons of diesel fuel per year. The milk plant would have had to use an additional 250,000 gallons of water, 17 million BTU's and 260,000 kilowatts per month. If other handlers used proportionate amounts of energy, the result would be wasted energy, unnecessary trucks cluttering the highways, increased hazard and accidents in residential areas where milk is delivered to the homes, pollution of the air with exhaust fumes, and wasted manpower - all of which was avoided by the Legislature's refusing to adopt the proposal.

We are inclined to believe that no longer can a Legislative approach to each issue stand alone. In our increasingly complex socio-ecological-economical system, you must now consider and

Comments by Neil Holbrook

balance all factors including higher food prices, wasted energy, unclean air, and the availability of milk for low income families. Yours is a complex and solemn stewardship you hold over our resources and we do not envy your high responsibility.

We respectfully request that you consider the alternatives available to you including the following: permitting the recently adopted open dating regulations to continue, or establish a statutory dating law similar to that of California requiring that milk be dated with the date the product would normally be removed from the shelf, or allow a different date for each distributor of milk, based on a sanitation rating issued by the Department of Health. Also consideration might be given to handling the problem by evaluatory statute or authority to a regulatory agency.

Again, let me say that Safeway appreciates this opportunity to make our views know to you. This concludes my statement.

NEIL HOLBROOK

COMMON SENSE IN PREDATOR CONTROL

BY W. O. NAGEL

Technical Editor, Missouri Department of Conservation

Members frequently inquire about the "Missouri system of predator control" and how it works. We asked Mr. Werner Nagel, who for some years has been associated with the Missouri Department of Conservation, to write an objective explanation.

Mr. Nagel is also Chairman of the Conservation Council, Outdoor Writers Association of America, and Vice President of Great Rivers Outdoor Writers Association.

THE MISSOURI SYSTEM of Extension Predator Control has been in effective operation since 1945. It has been highly satisfactory, from both the public relations and economic standpoints. Its effectiveness is due primarily to a logical, direct simplicity: essentially, it consists of training the landowner suffering damage to eliminate the *specific individual* doing it. This permits the highest possible efficiency in actual damage reduction, at the lowest possible cost.

It also means something else: by concentrating on the individual animal doing the damage, the rest of its species (which means, by far the greater number) remain to contribute their benefits as a necessary and valuable part of the whole wildlife complex. This underlines a basic principle of great importance: *there can be no true wildlife management except in accordance with the conservation principle of wise use.* This applies to predator management (a term much more realistic than "control") as well as to management of any other species.

In short, as applied in Missouri, this system meets the essential criteria of economic efficiency, good public relations, and accord with conservation principles.

It Wasn't Easy

This obviously simple solution wasn't so simply arrived at: there were too many strongly conflicting differences of viewpoint. The basis for the conflicts is perhaps best expressed in two contrasting definitions of "preda-

tor"; a definition of fact, and one that summarizes public opinion.

In simple fact, a predator is "Any animal that kills to eat." Webster says so, and so does science. This includes the swallow catching flies, the bass eating minnows, the lark eating grasshoppers, the skunk catching mice—it includes any and all animals that, by their eating habits, constitute our best natural defense against a group even more destructive than wolves, foxes, bobcats or coyotes—the insects, rodents and other herbivores that feed on our plant crops.

But people usually don't think of the insect and rodent eaters as predators. To express the prevailing popular view, we have to make up another definition: "*A predator is any creature that has beaten you to another creature you wanted for yourself.*" This definition brings it down to the personal basis, and it is less a definition than an explanation of why there are so many conflicting opinions about predators and predation. This is the view that has made the predator control controversy one of the most persistent and violent of any wildlife issues; it is the view that has caused the common feeling among conservationists that many programs, and much legislation, accede to public pressures rather than follow facts of wildlife management.

Missouri is no different from any other state in having had a long tradition in this personal view of predation. Legislation providing for payment of bounties on wolves, coyotes and bobcats goes back to 1825; it allowed

counties to pay bounties on these animals, with more or less aid from legislative grants. Missouri also ran the gamut of other "predator control" programs in the mode, including the U. S. Fish and Wildlife Service "government trapper" system, employment of a state hunter with dogs, encouragement of drives, etc. None of these, however, including the bounty, was effective in stopping the complaints of damage—complaints from farmers about predation on livestock and poultry, or from hunters about predation on game. They did not stop the continual demands from both groups for state and federal agencies to "do something about it".

Not a Serious Game Problem

Studies here and elsewhere revealed that, in suitable habitat, predation in the wild had little if any effect in reducing game abundance. On the contrary, it had beneficial effects in helping weed out the diseased, crippled or "stupid" individuals and in keeping game "wild"—an important item in the sporting qualities valued by sportsmen and nature lovers alike. The best "predator control" for game, then, was the same measure that would also increase abundance and distribution—habitat improvement.

The regulations of the Missouri Department of Conservation are in accordance with these facts. The Wildlife Code makes no distinction between predators and any other kind of wildlife: the word "predator" is not even mentioned in it.

The Department carries on no "predator control" for the protection of wildlife except habitat improvement, which helps wildlife protect itself. We recognize that any species may cause damage to property under certain circumstances, and provide for this as follows:

"1.30 *Owner May Protect Property.*—Subject to Federal regulations governing the protection of property from migratory birds, any wildlife which beyond reasonable doubt is damaging property may be captured or killed by the owner of the land where such property is being damaged, or by his agent, at any time and without permit, but only by methods permitted in this Code, except by written authorization of the Director. This may be done only on the owner's land to prevent further damage. Wildlife, so captured or killed may not be used, transported, sold or given away but must be reported to an agent of the Commission within 48 hours and disposed of in accordance with his instructions." (Wildlife Code of Missouri, 1965)

This provision recognizes both the wildlife management and public relations aspects of any depredation problem. However, it is not the complete solution;

there remains still one very important consideration—the debt we owe to the man on the land. In wildlife management alone, this debt is considerable: the farmer not only controls wildlife habitat, but also the hunting opportunities and other recreational uses available to a large extent only on private land. In recognition of this, the Department tries in every way within its scope to help the landowner solve his own management problems through sound practices compatible with conservation principles. Helping him control predator damage by methods in keeping with these principles is one such approach.

The "Problem" Species

Complaints of predator damage involve many species. However, they emphasize coyotes (often mistakenly called "wolves"), foxes and, in limited areas, bobcats. There are several reasons for this: these are the larger animals that sometimes prey on livestock, and loss of pigs and sheep is considered more serious than loss of poultry; these are traditional "predators," both because the persistent folklore has "wolves" and bobcats attacking people as well as livestock, and because they are named in the long-standing bounty system; they are clever in raiding and outsmarting all but skilled hunters or trappers trying to catch them. Thus the raiders among them do constitute a special problem.

The Extension Trapper Training Program was developed as a solution to this problem—a solution that was within our scope and did constitute a real service to the landowner. It emphasized trapping, for two reasons: this was the most effective way to catch the specific individual doing the damage; it was also a technique that could be readily taught to the landowners themselves, and was most adaptable to their use. Trapping also had the advantage of being a relatively humane method: the use of pairs of traps with offset jaws permitted holding the animal securely, without serious injury, until it could be quickly dispatched. An "innocent" animal happening to stumble into the set could be released uncrippled. Finally, competent trapping is specific; the unselective poison baits and poison "guns" are not.

Beavers Qualify

In recent years beaver have become numerous and widespread enough to cause significant local damage, mainly by damaging levees, damming ditches, causing crop damage (mostly corn) and destructive flooding. Depredations by non-predatory species are usually not handled by extension trapping. Beaver damage is an exception: because trapping is the most efficient control, training is given when requested where damage exists.

Unlike the named predators, beaver are not hard to trap. That training is requested underlines a point of view important to consider in ANY depredations problem. As stated by Allen Brohn, who supervises the Department's extension trapper service, "In any depredation situation, it's the new and unfamiliar, rather than the extent of damage, that causes the most comment and rouses the most complaint. This must be taken into account in the public relations part of the program; the control measures must be based on the actual amount of damage done."

How It Works

The program consists of two parts: the actual trapping training service, and a sustained information program. These supplement each other, and to some degree overlap; but the information program is broader in scope, and is directed to all segments of the public.

The Extension Training Service is a cooperative program. County agricultural extension agents act as local clearing centers for requests from farm groups, and arrange with the Department's predator control supervisor for predator control assistance. The Conservation Department's extension trapping instructor meets with the group, demonstrates trapping techniques to farmers desiring this instruction.

The quality of the instructor is very important. The development and application of simplified trapping techniques by our extension trappers, Lewis J. McIntosh (formerly) and Robert H. Smith (presently employed) has been a major contribution; their ability to discuss predation and other wildlife relationships, in terms of farmers' thinking, not only gave a broader view of predation but contributed importantly to the success of the program.

When possible, the demonstration is given right where a predator has been doing damage; the group is shown how to locate the best site where this specific individual may be caught, and the landowner concerned often makes the set under the instructor's guidance. All the important points are both explained and demonstrated to the group. Follow-up training is given to individuals desiring it. Our bulletin, "Predator Control—Why and How," is given to trainees for supplementary information and reference.

The Department's information program supplements the training service and goes beyond it into more general areas of wildlife interrelationships. Publications and movies range from explaining the Extension program to those discussing the role of predation in the wildlife complex and explaining predation as a necessary way of life. Less specific than these, but consistent with the

Department's concept of consistent information services, are references to the real meaning of predation in any article or movie when pertinent and appropriate to the subject.

The Department's views and actions on predation and predator control are not limited to any specific branch or activity; they are an integral part of the entire wild-life management program. Thus they are carried to the public through every avenue of public contact, including personal contacts by field men. The importance of this to understanding and cooperating with any Department program can hardly be over-emphasized. With Missouri's Extension Predator Control program, it undoubtedly contributed greatly to public acceptance of an approach in sharp contrast to long-established views and traditional programs.

The Proof of the Program

Figures are very useful devices—in fact, they can be used by almost anyone to prove almost anything he wants to prove, on any side of any argument. We have them; so do operators of any kind of predator control program. For example, Frank Sampson and Allen Brohn, analysing the program after eight years of operation, found annual operation costs to be about \$11,500 (with two trapper instructors) in comparison with annual coyote bounty payments running from \$55,000 to \$165,000. They found the trained farmer averaged 17.8 hours trap-tending time to catch a coyote, while the government trapper average was 60.3 hours. That's interesting: but the important thing—the real proof of both the economic and public relations value of the program—lies in what the landowners themselves report and how they react. Each year, the farmers trained are asked to report their losses for the year prior to trapping and the year following trapping. For the 20 years this program has been operating, their own reports show they have reduced their damage losses an average of 80 percent. But the fact that the damage complaints, formerly numerous under other programs, have dropped to almost zero is the most convincing proof of all. Interestingly enough, complaints of damage to other wildlife have also been greatly reduced.

Summing It All Up

Predation is a fact of life, but it is also a point of view. A predator is "any creature that kills to eat" (and that includes us), but many creatures that do this are not thought of as predators until they beat us to some other creature we wanted for ourselves. That is the personal view; it is the one on which damage complaints are based. It is often strong enough to overshadow recogni-

tion of predation as a necessary function in the wildlife complex, and as an important natural check on rodents, insects and other creatures which, uncontrolled, cause far more damage than most of the predators themselves. It is the view which keeps many people from recognizing the qualities of beauty, intelligence and wariness many predators contribute to the enjoyment of the outdoor scene.

The common sense approach to predator control interprets both views through the conservation principle of wise use. This makes no "moral" or legislative distinction between predators and any other form of wildlife; it does not saddle a whole species with the "sins" of outlaw individuals; it provides for control of marauders of any species, and preservation of the rest for their many values to many people; it operates on the basis that there is no conflict between scientific and aesthetic truth except in the prejudices of man himself.

EDITOR'S NOTE.—This system has been in effective operation in Missouri for 21 years and in Kansas for 17. In Missouri the specialist is attached to the Fish and Game Department, and in Kansas to the Agricultural College. One attachment has worked as well as the other. Missouri is Democratic, Kansas is Republican, and the specialist systems seem to work as well for one political party as for the other.

In each of the two States the total cost in taxpayers' money is less than \$11,500 per year—less than one-twentieth of the cost of the Federal predator control cooperative system in the adjoining State of Oklahoma.

DEFENDERS of WILDLIFE

731 DUPONT CIRCLE BUILDING, WASHINGTON, D. C.—20036

Honorable Thomas Hickey
Chairman Agriculture Committee
Nevada Assembly
Carson City, Nevada.

April 4, 1973.

Dear Thomas:

Norman and I regret that we are unable, due to ranching commitments, to attend the hearing in regard to AB 899 relative to predator control.

We are of the opinion that AB 899 is not proper legislation and therefore we oppose passage of this bill.

We do not feel that predator control has any valid basis, that the problems are individual and should be dealt with on an individual basis. Further, we believe that mandatory taxes should be avoided as much as possible; and that this is unnecessary legislation.

Again, I apologize for not being present for the hearing or for a more lengthy statement, but please consider this as testimony expressing our feelings. We would like this statement to be considered for the record.

Thank you for your consideration.

Sincerely,



Glaser Land and Livestock
Halleck, Nevada, 89824

Paradise Valley, Nev.
April 3, 1973 102

Mr. Bob Howard
Nevada Assembly
Carson City, Nevada

Dear Bob,

This is to express my opposition to AB 899 whereby livestock owners are assessed for predator control. This is to the benefit of the general public, not just the livestock owner. Anyone that is interested in wildlife, game, or hunting has a vital stake in this issue. Therefore the costs to provide these controls should be borne by all.

In regards to school matters there are a few bills which I feel will strengthen the hands of school boards and thereby improve the education climate in Nevada if they are passed. One of these is SB 370 which defines and clarifies that which is negotiable. AB 433 provides for some similar revisions. I feel these are very important. I realize teacher groups will oppose these and while I feel teachers have much to contribute to education, besides their teaching, the final decisions must be left to the trustees. Only they can consider impartially the interests of all concerned - students, parents, teachers, and the general public.

Any support that you can give to the above matters will be appreciated.

Sincerely yours,
Lyman Schwartz

96 RANCH

103

Established 1864

William Stock Farming Company

Paradise Valley, Nevada

COMMERCIAL CATTLE

Telephone 2641

April 2, 1973.

Mr. Melvin Howard, Assemblyman.

Carson City, Nevada.

Dear Bobe,

Alvin Miller and Larry Hill have expressed concern over a bill which would apparently put a predator control tax on all livestock, not just sheep. I missed this bill as it was news to me. I do know that Hammy Kent, President of the Nevada Cattlemen, met with the sheep men in Ely last fall and discussed this. Subsequently, there was a request in the "Nevada Rancher", the association newspaper, asking for comments for or against this idea. I wrote to the Association opposing the idea and tax. Since I heard no more of it I had assumed that there was much negative comment and the idea had been forgotten. But apparently not.

These coyotes are a darned nuisance and they do kill some calves, no doubt about it, and it seems they are killing more each year. However, I do not favor this tax, as I don't know what assurance we have that the money will kill enough coyotes to offset the damage. I am not in favor of solving every problem we have with more taxes. Just what the solution to the coyote problem is I don't know but there are several things that could be investigated besides tax. Or if I knew specifically what the tax would go for and how it was proposed to handle the coyotes it might make a difference in my thinking, at the present time I know the answers to none of these questions so oppose a tax on all livestock for predator control.

Yours truly,

Les
Leslie J. Stewart.

April 2, 1973

Melvin Howard
State Assemblyman
Nevada State Assembly
Carson City, Nevada 89701

Dear Bode:

Please be advised of our opposition to a bill, Number AB899, which is in the Assembly. As ranchers and stockholders in the Barmen Cattle Corporation, it is our opinion that this bill, which would impose a twelve (12) cent a head fee on cattle for predator control, is not in the best interest of the ranchers. We feel that the ranchers in a given area are better aware of their individual predator problems. We have this past year been a part of a local effort to control problem predators, and found that it worked very well at the local level. It is also our opinion that this bill, if passed, would have additional expense with the paper work and personnel that are always necessary to enforce programs. This matter should stay in the hands of the people most familiar with the problem, the livestock people.

Sincerely,

W. W. Hall
W. W. Hall

Barbara Jean Hall
Barbara Jean Hall