Tsu-Ling Chow and Fu-Ho Chen Oral History
Tsu-Ling Chow and Fu-Ho Chen, Interviewees
Dennis McGuire, Interviewer

August 5, 1982

Part II

Tsu-Ling Chow: ... and Farquharson you heard of, must be heard of a lot. Farquharson and...

Dennis McGuire: Oh, Farquharson?

Tsu-Ling Chow: You know, must heard.

Dennis McGuire: Oh yeah.

Tsu-Ling Chow: Lots of story about him. But yeah, as far as teaching, he is good teacher, but he was so strict.

Dennis McGuire: Did you know him?

Tsu-Ling Chow: I come here, I know him. But I come here not... Actually I knew him before I came here.

Dennis McGuire: You did?

Tsu-Ling Chow: Yeah. '45, during the war years, he was president of AVMA, for two terms. And always going to east meeting. I met him there. And I never expect I would come here. By the time I came here, he retired, but he was still alive. But in last few months, he died. In '54, he died.

Farquharson, you can hear lots of story. But he... Now, the good teachers. Gee...

Dennis McGuire: How was Farquharson as an AVMA president? Did he do a good job at that?

Tsu-Ling Chow: Yeah. At that time it was easier to do it. First, when he went, now he already had a national fame of a good surgeon. Everybody, practitioner had the respect of him. Second, AVMA wasn't a big group like now. Not so complicated. There's other very few schools, so the membership is not big, and people are more gentleman-like, not business-like.

So then during the war years, everybody busy on the war, fix it. You seen that. Cattle that you know they're going. Nobody was looking for fight and looking for argument on these issues. The whole country's in the war, you know? Nobody. So that's what he was, peace. So he was only one, he's the only one had two terms continuous as the president of the AVMA, because at that time, they didn't want to be in the world that [inaudible 00:02:02] the same thing, keep a status quo. Wait until this national crisis was-
Dennis McGuire: Oh, so that was the reason, and not...

Tsu-Ling Chow: ... Maybe it's a number of reasons.

Dennis McGuire: ... Oh, but was he good enough to serve two-

Tsu-Ling Chow: Yeah, he was, he was good, because at the time the problem was simple, not like now. Now, the constitution, right, is so... You see the [inaudible 00:02:25] of the local, the district world has lost say so. Just like our Congress. Everybody try to grab power.

Now the AVMA is a very complicated. Whoever it will be the secretary, the real headaches. You can ask [Kim 00:02:47]. Actually [Yung Kim 00:02:48] didn't have good personality. But he hang on all the time. People let him by.

Nowadays you cannot. People won't let you by if you're not good enough, if you don't have a good personality.

Dennis McGuire: Are there good teachers?

Tsu-Ling Chow: Yeah, that's why I mentioned a few of teachers at the moment that we write down, you know, good teachers. But research, you know. You cannot evaluate... This is what's difficult for our profession and mentally [inaudible 00:03:23], evaluate people. Because here you have different discipline, so different standard. You cannot evaluate other people without knowing that field of this particular things.

If you're a pathologist, I'm a virologist, how can you evaluate? Only if [inaudible 00:03:43] oh, boy you published some count by number. You got so much dollar rent, you got so much publisher, some paper. You [inaudible 00:03:51] how to do a job. That's only a part of it.

The important it is a person. And what kind? Maybe you are much better than I? But you handicapped by your dean, you handicapped by administration, what you can do? Can't buy a department.

Here, I just happen to have a good free hand. I can do it. I've got judgment. It's fortunate. Second thing, you have to have a serendipity. Research, yeah. Can be sometimes work [inaudible 00:04:30]. Sometimes [inaudible 00:04:30], come on. So it's a different discipline for me, for all nowadays [inaudible 00:04:38]. Everybody talking, okay, say everybody talking about horse disease. So? Society doesn't pay attention, government hasn't been paying there, so you have poor fellow history, you try to get it a million dollars of grant. See? That does not mean you're no good. See?

So it's just I would just say I think you better factor, I say, "I don't." I say, "If you want me to evaluate, why don't you evaluate? If you evaluate I won't take it." Because really, you've got to be biased. Either you're biased or ignorant. Say [inaudible 00:05:20]. Okay, I evaluate your course, you evaluate my course. If I don't know your field. Is that true?
Dennis McGuire: Yes.

Tsu-Ling Chow: Yeah.

But I said, "One thing you can time test, time will prove who you have who's a no good student." The student is sharp. They evaluate teachers. You ask a student, who are the good teachers? And 99 out of a 100 would be right. Students says, not faculty says.

So if you want to ask to evaluate, ask an alumni. And they'll say, many alumni always hate Farquharson. Everybody cussed him and hate him. Scared by him. But when come back, say, always respect. They found he was a-

Dennis McGuire: A good teacher.

Tsu-Ling Chow: I learned from him. My profession being on his teach, you see, time teach. I always say, "Teachers good or bad, time will tell, just like history of proof." History proves. Don't let the contemporary people evaluate your peers. That's no good. Particularly nowadays, people mind getting narrower and narrower, eyes getting sharper and sharper, and temper getting nastier and nasty, so you don't evaluate. It creates problems. That's what trouble is. University, keep on trying to evaluate people. Oh, you have a committee to evaluate a faculty? How can that committee of three or five people know all the fields in that university?

So this is a system, the administration all depend on an administrator. An administrator definitely doesn't know anything better, and he will ask committee to recommend. And he just take the recommendation. So you get the gaps, which is all right, so that what is some of our educators suggest, university shouldn't be too large. Large is no good. That become just like a government bureaucracy. What's good for, this president now here, this Christofferson? How good to you? You have nothing to do with him.

Dennis McGuire: I don't know anything about him.

Tsu-Ling Chow: He has nothing to do with you either. Now is that what, is that education assist? He doesn't do any education, he just doing politics all the time, and turn looking [inaudible 00:07:54], go to the Denver. Then it changed nature of university. See?

Well, where is education, where is the institute of education? And now become a political entity.

Dennis McGuire: Is it different in China?

Tsu-Ling Chow: China, you cannot say it different because the system different. Why I emphasize this country, don't forget the forefathers of this country. Never trust the government. Education always independent. You see? Education is the peoples' education, not government's idea.
In China, it's for other years, always education handled by government. Very, very few private education. So that's a system so different, you can't compare it.

Dennis McGuire: Yeah, of course.

Tsu-Ling Chow: You cannot compare. The tradition is they have that kind of policy. They have influence. They have their good points, they have their handicaps, drawbacks. Here, with now federal government graduates stick their finger into education. Stayed stuck in, because once you have stayed in college, you want handout from state and they stick finger. They will tell you, "Do this, do that," so the education will lose freedom.

That's what similar, you remember some of the universities they even don't want federal grant. "No, I don't want it. No. I'd rather keep a small university. 800, 1800, that's good enough. I don't want to turn this on just because [inaudible 00:09:36]."

But some just looking for money, who are looking for money, who will take it. So it's different, you know? Education is [inaudible 00:09:47]. But it's greatness of this country is a free education. You have free thinking, free [inaudible 00:09:53]. Who is right and wrong depend on your look, depend on the environment, depend on the time.

In the late sixties, no educators do it. Every campus was set on fire, [inaudible 00:10:11]. Can you see the education is wrong? No, you can't, from a historical point of view, how you evaluate the late sixties to survive chaotic conditions? What's a [inaudible 00:10:24]? Somehow, before the World War II, you already begin have a chaotic condition. Then after World War II, it's even worse. I mean chaotic, everything chaotic. Literature, music, human behavior, part of everything kept go extreme. Immediacy and extremism. This is what nowadays the world go.

You think about music. If you say Bach or Beethoven or Mozart, Brahms, you don't have those things. Nowadays it's contemporary music is in, it goes this way. Out, it goes this way. In, it goes this way, out it goes in. Too contrast, everything should... This is what you're servicing.

Dennis McGuire: [inaudible 00:11:18].

Tsu-Ling Chow: Sex, murder, violence. It's in more way, TV is the worst, you cannot talk about TV. I don't know TV, how much they offer to the public, how much damage it made for society. I believe it have more damage to society than offer good for the society.

But every country wants, everybody wants the TV. So this is the, we should ask the veterinary - no, no I should have said so. You should have said because you're a historian, you have the sharp eye, analytical mind to analyze and recognize it. Historians, they sit outside, to the side, and watch it and analyze it. That's a historian.

Dennis McGuire: It takes a while to...
Tsu-Ling Chow: That's true. But from a historical point of view, really quite short. Even 100 years is very short. So that's not a problem.

Now what else is there?

Dennis McGuire: How do you think the Department of Microbiology rates among other colleges, universities?

Tsu-Ling Chow: Oh, you see, this is another thing we are different. The microbiology department, each the vet school have their own historical background, have their own set up. Up to now, our microbiology I believe is one of the biggest in the veterinary colleges.

Dennis McGuire: Because it's centralized?

Tsu-Ling Chow: Not central, we have so many disciplines in one department. You see? You have veterinarian, microbiology, [inaudible 00:13:15], veterinary medicine, veterinary medical microbiology. You have pure science, microbiology. You have medical technologists. You have [inaudible 00:13:29]. You have fish disease. [inaudible 00:13:33]. You said [inaudible 00:13:34] they're political. You have fish disease so wildlife.

Maybe you have to check now, I don't think there was an old list, the old veterinary college, they don't have that big microbiology department.

The trouble is now it's very hard for them to find a good head of department. Head. With such so much diversify of discipline, and the head of the department very important.

Dennis McGuire: How about Bagby? Is he a good department head?

Tsu-Ling Chow: Well, yes, he has some advantage. He has had some administrative experience before he came. He was in the NIH. Oh yeah the CDC. You see? He was in the CDC, at administrative level. So he has the way of handling the people and the politics. And he has a good tactic to deal with people, good personality. He's smart and friendly.

But he is old. He doesn't want to do it anymore. You see? I heard he is going to retire now. So they are looking for a new head. Have you heard anything yet?

Dennis McGuire: No, I asked Morrison, but he didn't know either.

Tsu-Ling Chow: Of course, I can say something without reservation. Morrison won't because he is still there.

Dennis McGuire: You think he would have made a good department head?

Tsu-Ling Chow: Morrison? I don't think he wants it. It's this headache. Nowadays, nobody want to be. Just like who want to be a president of the United States? And here, who wants to be
head of department? One side, faculty pressure. Other side, administrative pressure. And besides, you stand in the middle, you don't have authority, you don't have access. Then why be head of department?

First everything good? Either faculty or administration always takes the credit, administrators take the credit. If you do something wrong, worse. So nobody want, particularly this is only five years, every five years you have to be evaluate by faculty. Why should I? Why they don't evaluate the tenured professors? No? This is not right.

So the [inaudible 00:16:16] system, the older system is not good because it said once you be head of department, you'll be a lifelong, then you'll become dead wood and they won't do anything, whole department affect. So, let's try, they got changing new system. They changing new system become every five year, so nobody wants. You see? This is no new system. Middle west, a big 10-year trial, for years. Wisconsin typical, nobody want department head. They find, okay, [inaudible 00:16:42].

Now we have full professors, have a general agreement. Everybody take turns. I take five years, [inaudible 00:16:50], next you take five, next you take five. Becomes easier, you can foresee, because why I didn't want, if I'm assigned this, I'm a good teacher. Five years will ruin my future.

Dennis McGuire: How about two years or maybe even one?

Tsu-Ling Chow: One year, two years, you can't. That makes that department head meaningless. Like you might hire a manager, or hire a secretary to live the routine. You don't need a head of department. You here one year, how can he make a decision?

Dennis McGuire: Right.

Tsu-Ling Chow: No good. One year or two years, no good. See?

Just like for the routine, say we have a new president, we don't need one. We can't just like sitting, we hire a manager, [inaudible 00:17:39] routine. We don't need a highly-paid secretary or manager, just highly-paid manager. See? This as a horror scene, you know, I just personally just rambling around, doesn't mean anything.

Dennis McGuire: You said that you think that environmental health will split from microbiology.

Tsu-Ling Chow: I guess, you know? Because it's too far from the department, if you stood as [inaudible 00:18:18] is the department, too far from the area.

Dennis McGuire: Yeah. What about fish disease. Do you think it will remain?

Tsu-Ling Chow: Well, this is the problem of the whole, the problem of better medicine fit. Everybody, the old veterinary studies, as a stark disease there, laying on the domestic animals, their proper disease, so they're proper. Then later on, some people said, "Oh check in on
their [inaudible 00:18:48]," so checking in. And for a while, nobody will take care of birds and fish.

Let's say zoologists maybe take it, but zoology don't have the medical background to take it. And the veterinarian medicine should take it, they have a medical background, but they don't have an interest. But now it changed. [inaudible 00:19:12].

When fish become an industry, fishery become industry, there's money there. When you have money, oh money talks. So now they want to go with it. So fish disease theoretically should be in the veterinarian.

But the problem is if zoologists, they have a fish diseases course, good enough for them, that's good enough. But unfortunately they don't have. So now who should take it? Someone has to take it. If I have a fish farm, I have five million pound of fish a year. I want a fish doctor here to look after. I don't want to [inaudible 00:20:03] organize their whole [inaudible 00:20:03]. See? And the fish just like a dog, just like human being, too many diseases, there's virus disease, parasite disease, bacteria disease, nutritional diseases. Just as us.

Birds, now they have pet, lots of pet bird, which should be some people have to take it. Of course most of the veterinarian will take it reluctantly, when they said to the office, they cannot do it. They said, "No, you cannot say no," so you got to take.

But I believe in the future training. You might have those people because now [inaudible 00:20:46] who have more and more women student in the vet school. And this fish disease and bird disease, physically they can handle. Large animal practice they have a physical handicap. Small animal, even small animal they can't do it.

But you see, bird, say birds, there's a good area. You cannot say nationwide, but on a certain area, see Hawaii?

Dennis McGuire: Mm-hmm (affirmative).

Tsu-Ling Chow: Hawaii is a good paradise, lots of birds. I mean, the pet bird in the house. So they need some people to look at, that's a good place to practice bird disease. Lots of zoos, who take care of zoos' animal and the birds there? The veterinarian will take care, you know? Girls for example.

Fish disease, women doctors can just [inaudible 00:21:43] and that's anybody. Because normally large animal practice, half is mind, half is muscle. See? How you restrain a cow or horse before you can check it? See?

But now, with more women I believe there will be in the specialized field, in the fish, bird and zoo animals. This, they will have more people who are into that. They should.

But now the problem is very few veterinary college have the fish disease course. See, we have. Georgia has. Texas A&M has. And I don't know, there's several south that has
them. But these three I know offhand. You see, who has a good fish disease, and said all right if you talk for trout and salmon. Washington. Not Washington State, the college in Pullman, but in Seattle, that institute aquatic, Ocean...? How you call it? Institute of Ocean...?

Dennis McGuire: Oceanographic?

Tsu-Ling Chow: Oceanograph, yeah. They have fishery because the importing of salmon and trout, and they have specialized people that are fishing today. Wisconsin, I tried to start it but no, we shouldn’t acquire... when I was in Wisconsin, there was department. No teachers, you know, just all research, purely veterinary research. Now they change it into a veterinary college, just started [inaudible 00:23:31].

Dennis McGuire: Who started the fish disease program here?

Tsu-Ling Chow: Here, is this [inaudible 00:23:38] starts with a ‘p’, this fellow, tall fellow.

Dennis McGuire: Is he in the vet college, or is he-

Tsu-Ling Chow: He had two hats. He is partly appointed in the fish and wildlife, and part in the department of microbiology, not government, okay?

Dennis McGuire: Pierson?

Tsu-Ling Chow: No, no, no. Pierson is a clinician for like...

Fu-Ho?

Fu-Ho Chen: Yeah.

Tsu-Ling Chow: What is the fishery disease man?

Fu-Ho Chen: Post.


Yeah, I believe he will going to retire soon. Or he already retired, maybe this year, I don't know.

Dennis McGuire: Morrison fears that when Post retires there won’t be any more fish disease technology.

Tsu-Ling Chow: Yeah, I don’t think it will have... There it will have, but it won’t be in the microbiology department.

Dennis McGuire: Oh.
Tsu-Ling Chow: Because this is a political setup. It happen that he has more friend in microbiology and fish disease [inaudible 00:24:48]. His fish disease and pathology and biology needs his help, and so even his student will be my graduate to studying virology. Why? Because he studied virus disease fish. So I take it, took it.

And George Post, he is the one being here a few years now. George Post, yeah. And yeah, if George Post retire, I doubt... They will still have fish disease but it won't be, maybe in wildlife only. Unless they have this way, this is College of Veterinary Medicine has institute of wildlife here. You know that?

Dennis McGuire: Yeah.

Tsu-Ling Chow: And maybe unless they will find a position there. Could be.

Dennis McGuire: Okay, Dr. Chow...

Tsu-Ling Chow: You want to talk to Mrs. Chow now?

Dennis McGuire: Yes, if she will.

Tsu-Ling Chow: Okay. Let me ask her.

Fu-Ho Chen: Want tea?

Dennis McGuire: Oh, no thanks, not right now.

Fu-Ho Chen: I didn't prepare for you to interview me too.

Dennis McGuire: I want to ask you about your research, especially in urinary calculosis

Fu-Ho Chen: In what respect you want to know?

Dennis McGuire: Well, just tell me a little bit about the project's history, and your efforts.

Fu-Ho Chen: Did Dr. Udall tell you most of it?

Dennis McGuire: Yeah.

Fu-Ho Chen: Then probably I shouldn't repeat.

Dennis McGuire: Oh, no problem. Because I get overlap all the time. You see? So don't worry about that. Just say whatever you want to.

Fu-Ho Chen: I really haven't organized my thought. I didn't know you were going to talk to me. But I can tell you a little bit about what we have done on urolithiasis.

I joined the research group of Dr. Udall and Dr. [Seeger 00:27:08] in 1957.
Dennis McGuire: Just after you got your PhD?

Fu-Ho Chen: Right. And that first year, Dr. Udall was on sabbatical leave. So I just did the lab work. And Dr. Seeger took the field work.

Then after Dr. Udall came back and I remained, and I worked with Dr. Udall. At that time, this calculi study was under the WICHE. And at the beginning, we worked mainly with cattle and the sheep. We wanted to prevent the disease more than treat them. And that approach of the prevention was mainly on dietary factor.

We tried several factors. And finally we found that salt, sodium chloride in the diet, which helped to prevent the capillary formation, especially the struvite calculi, that’s a magnesium ammonium phosphate. That is the kind of calculi produced in feline animals.

Dennis McGuire: And the silica calculi are produced in the range animals?

Fu-Ho Chen: Right. The silica calculi mostly in the range animal. But in the feedlot, the calculi found in sheep and cattle are struvite, and that’s the magnesium ammonium phosphate. Probably Dr. Udall has already told you about it.

After we have found that was helpful, so we thought we got the problem most likely solved. And then, the thing is that when we add sodium chloride in, if we want help for the small animals, like cats and the dogs and you don’t want there is that much salt in the diet, so and we thought... By the way, in the cats most of the calculi, again, is this kind of magnesium ammonium phosphate. And in the dogs, also many of them are magnesium ammonium phosphate.

But in the dogs, they are also other kinds. The one which is in good percentage is the oxalate, which is also the main kind in human, that’s the oxalate stone.

Dennis McGuire: Are these the same as kidney stones?

Fu-Ho Chen: Yeah, we talking about kidney stones. And kidney stone is one kind of urolithiasis. And then we are talking about a stone from not only in kidney, also in the bladder and the urethra and ureters. And the upper urinary tract, that’s the kidney. The lower is the bladder and the urethra where I was. And I was talking about in cats and dogs. They are the other kind of calculi.

Then we thought if [inaudible 00:31:50] because cats and dogs are pets, you want them to live for long range. So with that high sodium chloride might be harmful. So we thought we want to try with something else. And because we are dealing with phosphate calculi, and the solubility of those phosphates were increased tremendously in acidic medium. So we thought if we can make that urine acid, then we can increase the solubility.

Oh, I really simplified a lot of things because when we add sodium chloride not only said, increase the solubility of the salt, the phosphate, also because the chloride ion can
compete with phosphate ion, then make the stone not phosphate, not as magnesium phosphate. It's going to be a magnesium chloride, which is very soluble. That's why we use the sodium chloride to combat this thing.

And since sodium chloride is a neutral salt, so we thought if we can make the urine more acidic by introduce something else, then first we use a natural product, that's the alanine. Alanine is an amino acid. And we thought if we use amino acid we can make that urine might be a little bit more acidic. Also when you add alanine in the urine, you can make the urine more polar, that means can help increase the solubility of the insoluble salt. And we did have some success by adding alanine, the amino acid.

But we first tried that with rats and we got good result. But we had to use 5% of alanine in order to achieve the results.

Dennis McGuire: Is that a lot?

Fu-Ho Chen: That's a lot. 5% is high. In the early days, we even, there was group of MD in the Mayo Clinic. And they were interested in the alanine study, to prevent oxalate stone because in human, and there is one kind of oxalate stone occurred in infants, babies, children, which is definitely fatal. There's no way to cure them because they have the metabolic disease and the oxalate in the system is in a super saturation and they just deposit in the kidney, and the children, up to 13 years, they call the hyperoxalosis. Hyperoxalosis and it's a fatal disease.

And then doctor... I even cannot remember his name now. A doctor in Mayo Clinic called us, want us to cooperate with them, see if we can add alanine in the diet to prevent the seriousness of this hyperoxalosis. And I think they have two children, two girls had this disease. They had transplanted kidney, then they add alanine to the diet and give to the girls. And I think those two girls lived a little longer than the expected situation, and that was the research we did with the MDs, tried to help, use alanine to help prevent calculi.

And the most recent study, before I left, was using dietary control to prevent the calculi in cats. At the beginning, we used salt and that was very helpful. And with even the cats, use salt to prevent the cats to form calculi.

Then we control the diet by using the magnesium, calcium, phosphate ratio and amount in the diet to prevent the calculi. And we found out if a diet has a high magnesium, no matter if it has a high phosphate or low phosphate, it always can artificially or manually produce calculi in cats by control the magnesium phosphate, the calcium proportion, to produce or prevent calculi.

Dennis McGuire: So what's a balance of those-

Fu-Ho Chen: Yeah, it has to be high magnesium, it's the cause, and we found out. And this research was very much interest by the Morris Foundation, they supported us, and they used our result to formulate their diet. And that is one of the things they really interest in, is that
magnesium, phosphate, calcium. The amount and the ratio between these two in the diet, either to produce or prevent the calculi in cats, that is the thing.

And right before I was retiring, and we were testing for adding ammonium chloride in the diet. And see, we were talking about urine pH. When you get acid urine pH, and the solubility of that struvite increases then lessen the calculi formation. So we thought ammonium chloride should be a very good one because ammonium chloride can produce acid urine because of the chloride, it's a strong acid. So we did that and we can add half a percent of ammonium chloride in the urine, and we collected the urine from the cat, which is on ammonium chloride diet. And every four hours, we collect the urine. We tested the pH and the pH of that urine can maintain in the acid side all day long, which is very good. Then the cats were not produce calculi. This particular study has been substantial, and later by graduate student in the Dr. Hamar's lab, you know, in the pathology?

Dennis McGuire: Mm-hmm (affirmative).

Fu-Ho Chen: And she has substantial the evidence. Ammonium chloride is very effective in prevent the calculi formation in cats. And that is what I have done with the urinary calculi. It's a very brief manner, and if you want me substantialize or you have more question, want me to clarify...

Dennis McGuire: That's good for that, because we'll probably need to be general anyway.

One more thing, you also did some significant research in pine needle abortion.

Fu-Ho Chen: Right. Yes.

You know, pine needle abortion is almost like legend. The Indians in the early days, the American Indians using, the women take the pine needle, grind it up, extract with water, the aqueous extraction of a pine needle, and they want drink it and then that would cause abortion, cause women to abort.

Dennis McGuire: Did they do that on purpose?

Fu-Ho Chen: Yes.

Dennis McGuire: Oh, they knew that.

Fu-Ho Chen: Yes. But never had evidence. So we worked on it, and we want to see if it was the pine needle, the ordinary constituents of the pine needle which causes abortion, or something else. So we did some research on it, and we collect the pine needle from the local area. One year from another year, we used the same procedures. Some year the water extract can cause abortion of using mice, we feed the mice. But the other years had no effect.
And then some idea hit us. We thought maybe the mold grow on the pine needle. And that could cause abortion, and probably that was it. And some years that particular mold grow on that pine needle. And they use the pine needle constitute, make some metabolites. This metabolite, it’s toxic to cause abortion. But if that particular type of mold is not there, then it will not cause abortion.

Dennis McGuire: So you proved that it was the mycotoxin?

Fu-Ho Chen: We think it's the mycotoxin, which is produced. But then we did very well for a couple of years. And then we couldn't get the pine needle would cause abortion. And I think when the dry years come that the particular mold is not there, then we cannot get the same type of metabolites to cause them, or the mycotoxin to cause abortion.

Dennis McGuire: Is the project still going on?

Fu-Ho Chen: No, because we could not reproduce that after a couple of years, so past [inaudible 00:45:02] it's not conclusive. But in my mind, mycotoxin is the one. But we cannot have a conclusive data to reproduce it. but then nobody want to give us money anymore, so you just don’t go on without money. And this is a long-range research project. Mycotoxin it’s not one year, two years, can get it the results. Sometimes it takes a little longer to reproduce and get the results.

Dennis McGuire: Were there any other significant research projects, I mean, that you see as very significant that you worked on?

Fu-Ho Chen: I really think mycotoxin is a very good project, and would be very significant project for agriculture use, because it's a new field and not very much is known.

Dennis McGuire: How could you cure something like that?

Fu-Ho Chen: It's prevention. It's prevention is more important, diagnose and prevention. And it's more important than cure. Right now, I don't think a cure is... That's why we don't know very much about it. We should study, the one mycotoxin is best known is aflatoxin. You know more about aflatoxin. But the rest is not that much known in detail, any place. But United States, it's not that a big problem because in the grains and being stored in better condition, and so are the silage. And in foreign, some other countries, the mold is so common.

Here, we collect a lot of silage from some of the ranges around here. And we can always culture many, many kinds of mold in it. We do not know which one could be toxic. And that would be a wide open field. It's a long-range study. But it would be very beneficial to the agriculture. And some day, for instance, like here, the cattle had early abortion. Many of those abortion cases cannot be diagnosed by any means, they don't know. The cause is unknown. And could very well be a mycotoxin.

Dennis McGuire: So they don't know if... Do the cattle like the pine needle?
Fu-Ho Chen: Yes, they do.

Dennis McGuire: So it's probably what it is.

Fu-Ho Chen: Especially in some years, and if the snow is deep, they cannot get anything when the snow melt and then early in the spring and the pine needles on the ground, and they eat them and could be some mold already grow there with the dampness and if happen to be that particular mold present, then they could cause abortion.

Dennis McGuire: Where did you work?

Fu-Ho Chen: In the pathology department?

Dennis McGuire: Yeah. Did you work at Foothill's campus?

Fu-Ho Chen: No. In the white building, you know, which is the pathology building, in the chemistry lab. We have a chemistry lab and it's called chemical pathology lab. Dr. Udall used to be there too.

When did you talk to Dr. Udall?

Dennis McGuire: Second week in July. He's a quiet man.

Fu-Ho Chen: Quiet?

Dennis McGuire: Yeah. Fairly quiet.

Thank you.

Fu-Ho Chen: You're very welcome.