

What Will Farming Be Like In 1988 - "A Peek Into The Future"

By David S. Weaver

Former Director, N. C. Agricultural Extension Service

orig to
Bill Humphreys
N+O
2-7-63

We in America today enjoy the highest standard of living of any nation at any time in the history of the world. We point with pride to our nation's position of world leadership in almost every phase of human endeavor. A little research and some analysis will reveal that this progress made by a nation with only six percent of the world's land area and seven percent of the world's population has been possible largely because we have first met the primary concern of any progressive people. That first concern is an adequate supply of high-quality, low-cost food.

A hundred years of progress, springs largely from our "Land-Grant College System" whereby scientific facts are discovered by research and disseminated through education has increased agricultural efficiency to an unbelievable degree. In 1863 one farmer could only feed himself and four others, today he feeds twenty-six others and soon it will be forty, then fifty.

start (1) → Perhaps the most outstanding fundamental achievement of the human race is recorded in the history of the American farmer. By unlocking the secrets of nature our research has provided techniques enabling farmers to adjust, modify and improve the biological processes and environments of the plants and animals that provide us with food and fiber.

The selection, breeding, feeding and management of all domesticated animals and the same handling of crops has been so improved that fewer acres and fewer animals are needed now in terms of the number of people fed. By increasing acre yields and the productivity of each animal unit we have lowered costs. By improving quality we have raised nutritional values. And all of this has been done with the view of reducing food costs to all consumers. In 1962 the average American family spent only twenty percent of its income for food, a bargain equaled nowhere in the world. *stop* (1)

The seven million farm workers in the United States have an investment of two hundred billion dollars in land, buildings, equipment and livestock and they spend over twenty-five billion dollars a year for the necessary goods and services to turn out the agricultural commodities we all need and enjoy. Each year farmers purchase three billion dollars worth of tractors and machines; four billion worth of fuel and oil; one and a half billion for fertilizer and lime; 320 million pounds of rubber and 27 billion kilowatt hours of electricity.

Nearly forty percent of the labor force is engaged in supplying farmers, in farm production, and in processing and distributing farm products. In spite of their fundamental contributions, farmers receive only about two-thirds the per capita wage of non-farm workers.

Start (2)
The spectacular success in food and fiber production of the past two decades will be small in comparison with the events that lie ahead. Just as a manufacturer who "Tries to do today's job with yesterday's tools will find himself out of business tomorrow", so the farmer who cannot compete in the life and death struggle for efficiency that characterizes present agricultural production will not be farming twenty-five years from now.

Here are listed just a few of the many predictions made by agricultural specialists concerning their own special fields that we may see in effect by 1988. *stop (2)* In crops and soils:

Fertilization of our crops constitutes one of the major delays in the planting operation and requires extra operation through sidedressing to prevent leaching. Fertilizer mixtures are now available that release nitrogen at varying dates after application to the soil and are in a non-leachable form until they are made available for plant use. *start (3)* By 1988 fertilization of the crop will be a one-shot application for one or more years such as present liming methods. *stop (3)* This will be what they are now referring to when they say to fertilize the soil rather than the crop.

Weed control constitutes a major cost of agricultural production. We now have chemicals which can be spread on corn land to control all undesirable weeds during the growing of the crop. Similar chemicals are being developed for tobacco, soybeans, etc. Minimum tillage is now coming into more common use where an existing stand of grass is killed by a chemical weed control spray and the corn is planted without disturbing the dead sod. *start (4)* By 1988 chemical weed control will have largely replaced present cultivation methods and perhaps overcome the need for much of the land preparation. *stop (4)*

In the area of chemical plant regulators, it appears on the horizon that stimuli for inducing flowering is a real possibility. Also, stopping the fruiting process undoubtedly will be worked out by chemical processes. Thus a crop such as cotton could be made to fruit intensely during a favorable part of the season and then the fruiting cut off completely so that uniform ripening and harvesting could be facilitated. *stop (4)*

Farming in water versus land. As farm ponds develop, and pressure continues on the available land, more emphasis will be placed on water agriculture. Results now show that you can produce more fish per acre in an acre of water than beef on an acre of land. This is due

to the growth of algae through proper fertilization. We now think of it as only in terms of feeding fish. Since water would not be a limiting factor in production, proper breeding of the algae may make land production figures appear small in terms of feeding beef and other livestock.

Recent discoveries concerning the nature of nuclear proteins indicate that man will soon be able to control or modify genetic material. This ability will greatly facilitate the development of improved plant varieties and may even mean that the processes of plant growth and maturation may eventually be controlled.

start 5
 In animal production: *will result*
 The use of artificial insemination for all classes of livestock with a very rapid upgrading of production, quality and other desirable economic values. Control of the estrual cycle with great economic value. *holds great promise.*

Bull calves are by-product to dairy production. Techniques in breeding for sex will be developed to assure a high percentage of heifer calves. This will provide much more latitude for selection and culling; consequently, advancing the production per cow more rapidly.

Automation in dairy cattle feeding will continue. Dairymen will feed a pelleted feed that will combine roughage and grain. This will eliminate our laborious methods of harvesting, storing, and feeding hay. This will also require hay of higher quality.

Milk will be purchased from the farmer on the basis of total milk solids rather than on butterfat. Emphasis will be placed on total nutrient value to consumer. Fluid milk will be standardized to meet consumer desire.

Milk will provide immunity to certain infectious diseases. Cows will be fed certain types of antibiotics or perhaps other material that will go through into the milk that will develop resistance in humans when they consume this milk. *stop 5-*

start 6
 In poultry: Liquid diets will make possible even further increases in feed efficiency. A central mixing station will mix the diets and pump these out to individual poultry houses. Liquid diets would also simplify (1) introduction of medicants, hormones and growth stimulants, (2) control of water consumption in line with the needs of the birds, (3) introduction of oral vaccines, and (4) regulation of protein and energy levels of the diet. *stop 6*

Poultry litter is a valuable product of the poultry operation which is frequently wasted. Conceivable the litter could be used to fertilize ponds of algae or fish. The former could be used as human food or processed and fed back to poultry. Poultrymen in Thailand reportedly

make more profit from fish ponds fertilized in this manner than from their poultry.

Individual poultry operations with several million birds will be common. These farms will be staffed by graduate nutritionists, pathologists, geneticists, etc. The operation will be completely automated. In some areas, many operations will be underground. All will have temperature and humidity controlled.

Poultry in its present form will disappear from the market; it will all be sold pre-packaged and, in many instances, pre-cooked, probably in a disposable frying pan or like present "T.V. Dinners". This will mean that more poultry products will be served by the housewife in 1988, who may be a business woman, working away from home, but who will serve one or more meals a day to her family provided convenience in packaging has progressed as envisioned.

Step 7
The sale of eggs to consumers broken out into sealed containers whereby they can look at the eggs, see what they are getting and be assured of 100% high quality edible eggs at all times and they can purchase the number of eggs they desire. Also, these containers will possibly be of such material as to permit cooking therein, thereby never exposing the egg to atmospheric conditions. *Step 7*

In insect and disease control: Develop biological control of major insect and disease problems. This would include such as boll weevil resistant cotton, parasites for most destructive insects and resistance to disease forms. It now appears possible to develop a fertility practice that might control nematodes. Sex reversal in nematodes can be brought about by change of soil acidity at a particular time of development creating sterile populations. In wildlife and recreation:

^ Managing Farm Game (Quail, Rabbits, Squirrel, and Doves) as a cash crop. Incorporation of wildlife management into farm operation as a supplementary source of income. Administered on community or area basis. Supplies the increase demand by sportsmen for places to hunt to mutual benefit of landowner and hunter. The hunter will be insured of quality hunting country and the landowner will receive income for access privileges.

Future demand for fishing water will encourage pond management for sport fishing. New fish varieties and management methods will make this an economically worthwhile practice. Picnic areas, boat docks and rentals, and other accessories will be involved. Fish harvest for commercial market may be feasible by 1988.

Recreational potential of farm and forest lands. The basic conflict between the concept of intensive food and fiber production and the concept of multiple land use will be resolved. By 1988 recreational and esthetic demands will have made themselves known and will have found their place in agriculture. The landowner with "undeveloped", diversified holdings will have recreational products that will have a ready demand on the market.

^{Start 8} Mechanical devices, ^{will be developed} to lower costs, reduce labor, improve quality, etc.: As the tractor and electric motor have replaced the muscles of man and mule so many other mechanical devices are being developed to further increase efficiency and reduce drudgery:

In all probability by 1988 poultry will be produced in windowless houses which are ventilated by filtered air and all operations, such as brooding, feeding, watering, egg gathering, house cleaning and "what have you" will be electrically controlled. Feed will probably be supplied in a liquid state rather than in its present form. Broilers will be produced in a much shorter period of time. This can mean one person can produce three times the quantity of poultry food products one person now produces.

An electronic device will be developed that will fit into the pipeline system that will weigh each cow's milk as she is milked and analyze her milk for various constituents (fat, protein, etc.)

Use of extension telephones in all farm buildings, on the farm tractor, truck and automobile will save countless steps and greatly improve the farmer's managerial ability.

Automation, electronics and other scientific advances hold limitless possibilities for farm business.

Air conditioning, weather forecasting and control are about ready to add their contributions.

Watershed development, erosion control, drainage, land-forming and numerous other improvements in land and water use will be the rule rather than the exception ^{Step 8} in foods.

In another ten years or so, you will buy beef (and maybe pork, lamb and poultry) tenderized on the hoof through special feeding of the cattle; precooked canned roast beef; other precooked canned foods packed in gelatin -- hamburgers in cheese sauce, chicken a la king, ham salad, for example; more food concentrates. Special foods for the overweight, the elderly and the ailing will increase greatly in number. You will buy "freeze-dried foods"; they are dried, then frozen and put into airtight cans or pouches where they will keep for years. To use, you just immerse them in water. As for atomic-radiated foods (no refrigeration needed), research is

well along. Barring unforeseen problems, you will be able to buy them sometime between now
a 1988.

orig sent
Paul B
La Grange Gazette
3/13/63

Some Farming Changes In The Next 25 Years

by David S. Weaver

Former Director, N. C. Agricultural Extension Service

Perhaps the most outstanding fundamental achievement of the human race is recorded in this history of the American farmer. By unlocking the secrets of nature our research has provided techniques enabling farmers to adjust, modify and improve the biological processes and environments of the plants and animals that provide us with food and fiber.

The selection, breeding, feeding and management of all domesticated animals and the same handling of crops has been so improved that fewer acres and fewer animals are needed now in terms of the number of people fed. By increasing acre yields and the productivity of each animal unit we have lowered costs. By improving quality we have raised nutritional values. And all of this has been done with the view of reducing food costs to all consumers. In 1962 the average American family spent only twenty percent of its income for food, a bargain equaled nowhere in the world.

The spectacular success in food and fiber production of the past two decades will be small in comparison with the events that lie ahead. Just as a manufacturer who "tries to do today's job with yesterday's tools will find himself out of business tomorrow", so the farmer who cannot compete in the life and death struggle for efficiency that characterizes present agricultural production will not be farming twenty-five years from now.

Here are listed just a few of the many predictions made by agricultural specialists concerning their own special fields that we may see in effect by 1988.

By 1988 fertilization of the crop will be a one-shot application for one or more years such as present liming methods.

By 1988 chemical weed control will have largely replaced present cultivation methods and perhaps overcome the need for much of the land preparation.

In the area of chemical plant regulators, it appears on the horizon that stimuli for inducing flowering is a real possibility. Also, stopping the fruiting process undoubtedly will be worked out by chemical processes. Thus a crop such as cotton could be made to fruit intensely during a favorable part of the season and then the fruiting cut off completely so that uniform ripening and harvesting could be facilitated.

The use of artificial insemination for all classes of livestock will result in a very rapid upgrading of production, quality and other desirable economic values. Control of the estrual cycle with great economic value holds great promise.

Bull calves are by-product to dairy production. Techniques in breeding for sex will be developed to assure a high percentage of heifer calves. This will provide much more latitude for selection and culling; consequently, advancing the production per cow more rapidly.

Automation in dairy cattle feeding will continue. Dairymen will feed a pelleted feed that will combine roughage and grain. This will eliminate our laborious methods of harvesting, storing, and feeding hay. This will also require hay of higher quality.

Milk will be purchased from the farmer on the basis of total milk solids rather than on butterfat. Emphasis will be placed on total nutrient value to consumer. Fluid milk will be standardized to meet consumer desire.

Milk will provide immunity to certain infectious diseases. Cows will be fed certain types of antibiotics or perhaps other material that will go through into the milk that will develop resistance in humans when they consume this milk.

Liquid diets will make possible even further increases in feed efficiency. A central mixing station will mix the diets and pump these out to individual poultry houses. Liquid diets would also simplify (1) introduction of medicants, hormones

and growth stimulants, (2) control of water consumption in line with the needs of the birds, (3) introduction of oral vaccines, and (4) regulation of protein and energy levels of the diet.

The sale of eggs to consumers broken out into sealed containers whereby they can look at the eggs, see what they are getting and be assured of 100% high quality edible eggs at all times and they can purchase the number of eggs they desire. Also, these containers will possibly be of such material as to permit cooking therein, thereby never exposing the egg to atmospheric conditions.

Mechanical devices will be developed to lower costs, reduce labor, improve quality, etc.: As the tractor and electric motor have replaced the muscles of man and mule so many other mechanical devices are being developed to further increase efficiency and reduce drudgery.

In all probability by 1988 poultry will be produced in windowless houses which are ventilated by filtered air and all operations, such as brooding, feeding, watering, egg gathering, house cleaning and "what have you" will be electrically controlled. Feed will probably be supplied in a liquid state rather than in its present form. Broilers will be produced in a much shorter period of time. This can mean one person can produce three times the quantity of poultry food products one person now produces.

An electronic device will be developed that will fit into the pipeline system that will weigh each cow's milk as she is milked and analyze her milk for various constituents (fat, protein, etc.).

Use of extension telephones in all farm buildings, on the farm tractor, truck and automobile will save countless steps and greatly improve the farmer's managerial ability.

Automation, electronics and other scientific advances hold limitless possibilities for farm business.

Air conditioning, weather forecasting and control are about ready to add their contributions.

Watershed development, erosion control, drainage, land-forming and numerous other improvements in land and water use will be the rule rather than the exception.

Agronomy Specialist
WILLIAMS HALL



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AGRICULTURAL EXTENSION SERVICE

COOPERATIVE EXTENSION WORK IN AGRICULTURE & HOME ECONOMICS
NORTH CAROLINA STATE COLLEGE · RALEIGH, NORTH CAROLINA

January 25, 1963

MEMORANDUM

TO : David S. Weaver, Special Assistant to Dean of Agriculture
FROM : E. R. Collins
SUBJECT : "A Peek Into the Future - What Will Farming Be Like In 1988"

The following comments refer to "A Peek Into the Future - What Will Farming Be Like in 1988".-

1. Fertilization of our crops constitutes one of the major delays in the planting operation and requires extra operation through sidedressing to prevent leaching.

Fertilizer
Urea-formaldehyde mixtures are now available that release nitrogen at varying dates after application to the soil and are in a non-leachable form until they are made available for plant use.

A
Certain fertilizer nutrients become unavailable to the plants because of fixation by the soil. Chelated iron compounds, fretted materials, (iron combined with various silicates) and similar compounds can be made to keep iron from being made unavailable to the plants.

I anticipate that by 1988 fertilization of the crop will be a one-shot application for one or more years such as present liming methods. This will be what they are now referring to when they say to fertilize the soil rather than the crop.

2. Weed control constitutes a major cost of agricultural production. We now have *chemicals* atrazine which can be spread on corn land to control all undesirable weeds during the growing of the crop. Similar chemicals are being developed for tobacco, soybeans, etc. Minimum tillage is now coming into more common use where an existing stand of grass is killed by a chemical weed control spray and the corn is planted without disturbing the dead sod.

B
I anticipate that by 1988 chemical weed control will have largely replaced present cultivation methods and perhaps overcome the need for much of the land preparation.

3. Systemic insecticides are now playing a part in the insect control program with peanuts and except for fruiting problems, with cotton.

I anticipate that systemics will play a major part in insect control by 1988.

4. The state corn champion in 1962 made 188 bushels per acre. This is approaching the long sought after 200 bushel yield.

Small grain yields in this state are becoming unprofitable because of their low yield per acre.

Associated with the higher soil fertility, and better control of the release of nutrients given above, I anticipate that both corn and small grain breeders selecting on land producing 150 bushels of oats and 200 bushels of corn will make present goals commonplace.

over

(1)

David S. Weaver

- 2 -

January 25, 1963

To support this contention, it is no longer an accomplishment to become a member of the 100 Bushel Corn Club, the Two-Ton Peanut Club (a 5 ton peanut yield in 1963), the Two Bale Cotton Club (45 members in 1963), etc. 24

- D
5. Farming in water versus land. As farm ponds develop, and pressure continues on the available land, more emphasis will be placed on water agriculture. Results now show that you can produce more fish per acre in an ~~acre of water~~ in an acre of water than beef on an acre of land. This is due to the growth of algae through proper fertilization. We now think of it as only in terms of feeding fish. Since water would not be a limiting factor in production, proper breeding of these algae may make land production figures appear small in terms of feeding beef and other livestock.

ERC/ds

(2)

Crop 4

Some Predictions or Possibilities In the Next 25 Years

in the Field of Crop Science

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

1. (a) Subject: Controlled flowering and fruiting of crop plants
(b) Brief description, progress and what it can mean: In the area of chemical plant regulators, it appears on the horizon that stimuli for inducing flowering is a real possibility. Also, stopping the fruiting process undoubtedly will be worked out by chemical processes. Thus a crop such as cotton could be made to fruit intensely during a favorable part of the season and then the fruiting cut off completely so that uniform ripening and harvesting could be facilitated.
Use of tropical grasses for enormous forage yields in semi-
2. (a) Subject: tropical areas.
(b) Brief description, progress and what it can mean: Many of the tropical grasses produce enormous yields of forage but of low quality for animal nutrition at the present time. By breeding for high quality and with the proper crop management practices, it is feasible that very high tonnages of high quality forage will be produced by such grasses or their hybrid descendants in the future.
3. (a) Subject: New crops for industrial products
(b) Brief description, progress and what it can mean: The January, 1963, issue of Agricultural Research, a USDA publication, has a very good article on new seed oils for industry. In this is reviewed the status of research work on Indian ironweed, Cape Marigold, Crambe, Meadowfoam, and Lesquerella. If you do not have access to this bulletin, I will be glad to lend you my copy.
4. (a) Subject: Crop production under controlled environmental conditions.
(b) Brief description, progress and what it can mean: The many phytotrons and growth chambers which are being worked with across the country, coupled with the increased use of herbicide, fungicide, and insecticide chemicals with irrigation and soil modification may lead to the possibility of growing crops under ideal field conditions. Horticulturists and floriculturists are now doing this to a limited extent. In 25 years it may be entirely possible that even our bread and feed crops will be grown under the most uniform and controlled conditions that we now find in greenhouses and special environmental chambers.

P. H. H.

Submitted by Paul H. Harvey, Crop Science Dept.

Date January 22, 1963

3

Some Predictions or Possibilities In the Next 25 Years

in the Field of Botany

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

- 1. (a) Subject: A Utilization of Aquatic Areas for Food Crops
- (b) Brief description, progress and what it can mean:

A few plant crops such as rice and marine algae are currently cultivated in aquatic habitats. Many other plants could be cultivated in aquatic habitats also. Thus, the total food supply of the earth could be measurably increased.

- 2. (a) Subject: Chemical Control of Plant Growth and Inheritance
- (b) Brief description, progress and what it can mean:

Recent discoveries concerning the nature of nuclear proteins indicate that man will soon be able to control or modify genetic material. This ability will greatly facilitate the development of improved plant varieties and may even mean that the processes of plant growth and maturation may eventually be controlled.

- 3. (a) Subject:
- (b) Brief description, progress and what it can mean:

- 4. (a) Subject:
- (b) Brief description, progress and what it can mean:

Submitted by Botany and Bacteriology

Date January 28, 1963

4

Some Predictions or Possibilities In the Next 25 Years

in the Field of Dairying

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

- 1. (a) Subject: Milk will be bought and sold on basis of total solids
- (b) Brief description, progress and what it can mean:

H

Milk will be purchased from the farmer on the basis of total milk solids rather than on butterfat. Emphasis will be placed on total nutrient value to consumer. Fluid milk will be standardized to meet consumer desire.

- 2. (a) Subject: Feeding
- (b) Brief description, progress and what it can mean:

G

Automation in dairy cattle feeding will continue. Dairymen will feed a pelleted feed that will combine roughage and grain. This will eliminate our laborious methods of harvesting, storing, and feeding hay. This will also require hay of higher quality.

- 3. (a) Subject: Breeding for Sex
- (b) Brief description, progress and what it can mean:

F

Bull calves are a by-product to ~~the~~ dairy production. Techniques will be developed to assure a high percentage of heifer calves. This will provide much more latitude for selection and culling; consequently, advancing the production per cow more rapidly. *in breeding for sex* ✓

- 4. (a) Subject: Farm management and operating records
- (b) Brief description, progress and what it can mean:

The dairy farmer will provide a monthly list of farm receipts and expenses to a central electronic machine operation where a complete farm account system will be kept for him. Financial records will be summarized and analyzed to provide unit and enterprise costs and profits. Annual financial statements will be prepared as well as his income tax reports.

(OVER)

Submitted by Marvin E. Senger, (Acting) In Charge
Extension Dairy Husbandry
Date January 28, 1963

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(A)

(4)

5.

I

(a) Milk will provide immunity to certain infectious diseases.

(b) Cows will be fed certain types of antibiotics or perhaps other material that will go through into the milk that will develop resistance in humans when they consume this milk.

6.

(a) Weighing and analyzing individual cow's milk in pipeline milking arrangements

T

(b) An electronic device will be developed that will fit into the pipeline system that will weigh each cow's milk as she is milked and analyze her milk for various constituents (fat, protein, etc.)

Full calves are a by-product of the dairy production. Techniques will be developed to ensure a high percentage of heifer calves. This will provide much more income for selection and culling; consequently, advancing the production per cow more rapidly.

The dairy farmer will provide a monthly flow of farm receipts and expenses to a central electronic machine operation where a computer data account system will be kept for him. Financial records will be maintained and analyzed to provide unit and percentage costs and profits. Annual financial statements will be prepared as well as the income tax returns.

Developed by Irvin R. Berger, (acting) in charge
National Dairy Research
January 22, 1963

15

Some Predictions or Possibilities In the Next 25 Years

in the Field of Poultry Science

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

1. (a) Subject: Liquid Diets

(b) Brief description, progress and what it can mean:

Liquid diets will make possible even further increases in feed efficiency. A central mixing station will mix the diets and pump these out to individual poultry houses. Liquid diets would also simplify (1) introduction of medicants, hormones and growth stimulants, (2) control of water consumption in line with the needs of the birds, (3) introduction of oral vaccines, and (4) regulation of protein and energy levels of the diet.

2. (a) Subject: Poultry Litter

(b) Brief description, progress and what it can mean:

Poultry litter is a ~~This~~ valuable product of the poultry operation ^{which} is frequently wasted. Conceivably the litter could be used to fertilize ponds of algae or fish. The former could be used in the diets of poultry and livestock. The latter could be used as human food or processed and fed back to poultry. Poultrymen in Thailand reportedly make more profit from fish ponds fertilized in this manner than from their poultry.

3. (a) Subject: Size and Management of Poultry Farm

(b) Brief description, progress and what it can mean:

L Individual poultry operations with several million birds will be common. These farms will be staffed by graduate nutritionists, pathologists, geneticists, etc. The operation will be completely automated. In some areas, many operations will be underground. All will have temperature and humidity controlled.

4. (a) Subject: Disease Control

(b) Brief description, progress and what it can mean:

New methods of disease control will be found. Vaccines will be developed which periodically cast off antigenic particles into the circulation affording a higher level of immunity to a variety of diseases. Other advances in disease control will make the occurrence of disease a rarity.

Submitted by *Henry W. Garren*
Henry W. Garren
Date 24 January 1963

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Page 4

Some Predictions or Possibilities In the Next 25 Years

in the Field of POULTRY

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

- 1. (a) **Subject:** The production of poultry under total controlled conditions
 (b) **Brief description, progress and what it can mean:** In all probability by 1988 poultry will be produced in windowless houses which are ventilated by filtered air and all operations, such as brooding, feeding, watering, egg gathering, house cleaning and 'what have you' will be electrically controlled. Feed will probably be supplied in a liquid state rather than in its present form. Broilers will be produced in a much shorter period of time. This can mean one person can produce three times the quantity of poultry food products one person now produces.
- 2. (a) **Subject:** Poultry Merchandizing
 (b) **Brief description, progress and what it can mean:** Poultry in its present form will disappear from the market; it will all be sold pre-packaged and, in many instances, pre-cooked, probably in a disposable frying pan or like present 'T.V. Dinners'.
 This will mean that more poultry products will be served by the housewife of 1988, whom I visualize as being a business woman, working away from home, but who will serve one or more meals a day to her family provided convenience in packaging has progressed as envisioned.
- 3. (a) **Subject:** Egg Marketing
 (b) **Brief description, progress and what it can mean:** There has been little improvement in one sense in the marketing of eggs during the past quarter century. I can readily envision the sale of eggs to consumers broken out into sealed containers whereby they can look at the eggs, see what they are getting and be assured of 100% high quality edible eggs at all times and they can purchase the number of eggs they desire. Also, these containers will possibly be of such material as to permit cooking therein, thereby never exposing the egg to atmospheric conditions.
- 4. (a) **Subject:** Greater use of electricity for all purposes - in the home, on the poultry ranch.
 (b) **Brief description, progress and what it can mean:** Greater use of electricity will be made in all areas of life - in the home, on the poultry ranch, in the production, processing - which by some will be called further processing - and in the merchandizing of these products in different forms than are now available. Examples would be vending machines whereby purchasers could secure frozen or warm poultry food products and have a wide selection of either.

S

M

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Submitted by C. J. Pank
Date January 22, 1963

7

Foster

Some Predictions or Possibilities In the Next 25 Years

in the Field of _____

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

1. (a) Subject: Genetics
 (b) Brief description, progress and what it can mean:
 Irradiation genetics is likely to develop to the place where we can direct artificial mutations and create the ones desired.
 Behavioral genetics: Develop an understanding of the inheritance of behavior. Possibly control the breeding of animals to the extent of predicting the behavior and perceptive characters.

2. (a) Subject: Marine Biology
 (b) Brief description, progress and what it can mean:
 Develop a sufficient understanding of marine forms to correct the problems of our commercial fishing. Learn to culture, control and develop the oysters, shrimp, etc. to the point where major harvests are reaped from coastal waters.

3. (a) Subject: Entomology and Pathology
 (b) Brief description, progress and what it can mean:
 Develop biological control of major insect and disease problems. This would include such as boll weevil resistant cotton, parasites for most destructive insects and resistance to disease forms. It now appears possible to develop a fertility practice that might control nematodes. Sex reversal in nematodes can be brought about by change of soil acidity at a particular time of development creating sterile populations.

4. (a) Subject: Closed Biological System
 (b) Brief description, progress and what it can mean:
 Work is advancing rapidly on developing a closed biological system that would enable complete existence in a self-contained environment. This will include waste regeneration which (like it or not) might (?) solve the food problem of expanding populations.

Submitted by *A. J. Foster*

Date 1/5/63

8

Some Predictions or Possibilities In the Next 25 Years

in the Field of Wildlife Extension

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

- P
1. (a) Subject: Managing Farm Game (Quail, Rabbits, Squirrel, Doves) as a cash crop.
 (b) Brief description, progress and what it can mean: Incorporation of wildlife management into farm operation as a supplementary source of income. Administered on community or area basis. Supplies the increased demand by sportsmen for places to hunt to mutual benefit of landowner and hunter. The hunter will be insured of quality hunting country and the landowner will receive income for access privileges.

- Q
2. (a) Subject: Fishing in farm impoundments
 (b) Brief description, progress and what it can mean: Future demand for fishing water will encourage pond management for sport fishing. New fish varieties and management methods will make this an economically worthwhile practice. Picnic areas, boat docks and rentals, and other accessories will be involved. Fish harvest for commercial market may be feasible by 1988.

3. (a) Subject: Supplying demand for outdoor recreation to urban population.
 (b) Brief description, progress and what it can mean: The demand for "getting out" by the urban population will be tremendous. Private landowner with facilities for camping, hiking, boating, etc., will have product in great demand.

- R
4. (a) Subject: Recreational potential of farm and forest lands
 (b) Brief description, progress and what it can mean: The basic conflict between the concept of intensive food and fiber production and the concept of multiple land use will be resolved. By 1988 recreational and esthetic demands will have made themselves known and will have found their place in agriculture. The landowner with "undeveloped", diversified holdings will have recreational products that will have a ready demand on the market.

Submitted by Hugh M. Fields
Extension Wildlife Specialist
 Date January 28, 1963

Received by me 1-28-63

Hugh Fields

Some Predictions or Possibilities In the Next 25 Years

in the Field of Agricultural Engineering

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

1. (a) Subject: Mechanization
(b) Brief description, progress and what it can mean:
All repetitive operations in the production of tobacco, cotton, peanuts, etc. will be reduced to mechanical means to provide several orders of magnitude of increase in power per operator.

2. (a) Subject: Environmental Control
(b) Brief description, progress and what it can mean:
Quantitative descriptions of optimum conditions for plant and animal growth will result in prediction and control sufficient to expertly programmed agricultural productions.

3. (a) Subject: Water management
(b) Brief description, progress and what it can mean:
Necessity will produce research results and appropriate technologies to maximize water utilization through effective conservation and balanced partitioning.

4. (a) Subject: _____
(b) Brief description, progress and what it can mean:

Submitted by F. J. Hassler

Date January 24, 1963

+ Beef
SWINE - Kelly

37

1. Artificial insemination. Estrual cycle control. —
2. Decrease in the number of swine producers with a corresponding increase in size of enterprise. —
3. Complete environmental control. _____
4. Elimination of certain diseases. Hog Cholera being one example —
5. Feed efficiency will increase to at least 3 to 1.
6. Male animals will not be castrated.

BEEF CATTLE

Kelly

1. Artificial insemination. —
2. Sex control. — _____
3. Specialized breeders with commercial producers purchasing all replacement animals as is now done in poultry industry.
4. Changing merchandizing of meat with more standardization of the different cuts.
5. Both hogs and beef cattle will be bred with less fat on the outside of the meat with enough marbling on the inside to make the meat desirable from a consumer's standpoint.

Some Predictions or Possibilities In the Next 25 Years

in the Field of Animal Science

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

1. (a) Subject: Research - Basic - On Campus
(b) Brief description, progress and what it can mean:
Animal reaction to environmental and nutritional stresses and their interaction to genetic make-up.

Progress: We now have the new Reproductive Physiology Lab. in which we are studying the effect of temperature and genetics on embryo survival. This may lead to recommended practices whereby the number of pigs farrowed per litter can be increased.

2. (a) Subject: Research - Applied - On the Farm
(b) Brief description, progress and what it can mean:

Economic or production cost data that will find loopholes in management.

Progress: The Departments of Ag. Economics and Animal Science have plans underway to set up records programs in the area of beef and dairy cattle. This will provide our extension specialists and farmers with data that will bring about greater efficiency in our livestock industry.

3. (a) Subject: _____
(b) Brief description, progress and what it can mean:

4. (a) Subject: _____
(b) Brief description, progress and what it can mean:

Submitted by I. D. PORTERFIELD

Date January 30, 1963

Dairy Specialist
POLK HALL



AGRICULTURAL EXTENSION SERVICE

COOPERATIVE EXTENSION WORK IN AGRICULTURE & HOME ECONOMICS
NORTH CAROLINA STATE COLLEGE · RALEIGH, NORTH CAROLINA

January 28, 1963

Mr. David S. Weaver
Special Assistant to
Dean of Agriculture
Patterson Hall
Campus

Dear Mr. Weaver:

Enclosed are a few predictions which I am suggesting for dairying.

Our British friends have gone so far as to say that milk will be made from pea hulls, cabbage leaves and weeds, but I am still a little partial to the cow. I believe she will be the intermediate step in converting such items into human food. At least I am sure it will be more tasty.

In addition to the predictions I am enclosing, I think we can consider many cows will be producing rather regularly 25 to 30,000 pounds of milk per cow in a 10-month period. We have a few hitting the 25,000 pound mark now, but I am saying this will be considerably more common than it is now. Enclosed is a machine processed 305-day production record of a registered cow at Cherry Hospital, Goldsboro, that has produced 1,000 pounds of butterfat. This cow was milked twice a day and is the first 1,000 butterfat record we have ever made in North Carolina for a cow milked two times a day for 305 days. You will note that she gave 24,240 pounds of milk. This is a good example that we are pushing the lid off of the top as far as production per cow is concerned. This almost outstrips the goat record I gave you.

If you have any questions or if I can be of further help, please let me know.

Very truly yours,

Marvin E. Senger, (Acting)
In Charge, Extension Dairy Husbandry

MES/mr

Encl.

Some Predictions or Possibilities In the Next 25 Years

in the Field of Entomology

(Send to David S. Weaver, 110 Patterson Hall by January 28, 1963)

- 1. (a) Subject: _____
 (b) Brief description, progress and what it can mean: Fight "Boll Weevils" by using attractants to pull them to weeds or into another area. Probably quite expensive to do and will take money to work out details. 1

- 2. (a) Subject: _____
 (b) Brief description, progress and what it can mean: It appears we may have a lead in making boll weevils sterile by spraying chemicals on large numbers and then releasing. Problem now is to develop the rascals on a cheap diet. Cannot say now if it can be done. ✓

- 3. (a) Subject: _____
 (b) Brief description, progress and what it can mean: Believe use of chemicals from the "systemic" standpoint may have possibilities on some crops and some insects in the future. Effect on plant as well as possible residue hazard appears now to limit necessary cash outlay to develop. Again, expense is the problem.

- 4. (a) Subject: _____
 (b) Brief description, progress and what it can mean:

Submitted by George D. Jones
 Date 1-29-63

P. S.: Will be glad to discuss more in detail.

Art for NTO June 25

A Peek Into the Future What Will Farming Be like in 1973, 1983-1988

10

20

25

Feeding 28 - soon 50 - maybe 100 -

Artificial Insemination
Feeding by Computer

Mechanized - Transport - Lifting

Automated - Caring Tot - Crops - pipe line
milking
butts tanks
etc.

Chemicals

Biological Advances -

1. Breeding
2. Eradication of Screw worm
" " Roaches Female Line

Transportation

Communication - Telephone - in Truck or
Tractor

Irrigation - Weather Control + predictions -

Former predictions - R.E. - Rubber trees
Irrigation

Crop Insurance

Land Leveling extended

Paved Barn Yards & Damage

Drainage.

Buildings - Automation Built In

Safety - Machinery -
Chemicals.

Sanitation -

Rodent Control.

Crop Processing - Conditioning.

Meet Market Demands - Job.

Lean Meat

Fruits - Acid, freezing, shipping

Packaging - Merchantizing?

Plant Breeder

Animal Breeder

Washed Development -

Gov't Controls?

Contract Farming - (for a market)

pp 8

atom radiated foods (no ~~energy~~ ^{refrigerator}) ^{made}

Colleg Education

Trucks + car

Air freight

Land values - presence ^{pp}

increase pp 12

Water - water everywhere
But

Share

Plankton - algae?

Physical -

Chemistry

Physics - forces, power

Electronics

Land
Water
Air

Along
Water - Air
Biological

Plants - timber

yield per acre

Animals

Eggs per hen
Milk per Cow
a.s. - Goat 5750

Social - Recurrence

Management

Labor Use

Economic - Profits

Units of Products

Input vs. Output

People - change in diet
" " work load
Population
age change. Leisure -

Forming a Business
not made of life 5 years from 63
1988

Telephones - Extensions - Vehicle - Car - Truck + tractor

Remote Control - Tractors + Machines

Air Conditioning - Dairy Barns
Hog House
Poultry "

Use of Chemicals - Exact needs + amounts

Take Feed to Animals
Materials Handling - Forks
Hydraulic
Tub (Pipe-line)
O Competitive
O Specialization
several lines
to balance
labor
use
O Yields per a

Disappearance of Family Core Management tools
" Gardening
" Fruit trees
" Poultry flocks.

Organized for Vacation (over)
30 Hour Work Week

Unions - Ag Labor & Maybe Farmers

Pop 250, million } more old folk
" children
Rf 2 - schools

Now make our own Genuses

Used to wait till one was
born by accident

90% Scientists alive today

with 25% of All people alive
today

Chemicals

Electricity - Fresh butter

Salt water

Building design
function

Nuclear Power

Weather Control & predictions

Computer - Electronics one

February 7, 1963

Mr. Bill Humphries
The News & Observer
Raleigh, North Carolina

Dear Bill:

Well here 'tis!

Perhaps you will think I didn't follow one of my favorite mottoes, "Eschew jejune sesquipedalianism" but some of these "predictions" are direct quotes from the "higher literates" I work with and I was afraid to change them.

Edit as you see fit!

Sincerely,

Dave Weaver

DSW:lb

Enclosure

NORTH CAROLINA STATE COLLEGE
SCHOOL OF AGRICULTURE • RALEIGH, N. C.

OFFICE OF THE DEAN AND DIRECTORS

March 13, 1963

Mr. Paul A. Barwick
% The Weekly Gazette
LaGrange, North Carolina

Dear Friend Paul:

Enclosed is my effort in response to your letter for help dated
March 7, 1963.

The time was so short I did not have too much time for research
and this is the best I could do in a short period.

You can edit it or throw it out if not satisfactory.

Yours for progress

David S. Weaver
Special Assistant to
Dean of Agriculture

DSW:1b

Enclosure

OFFICE OF:

PAUL A. BARWICK

President

PHONE LO6-3776

PAB Publishing Co.

Box 308

LaGrange, N. C.

Publishers Of:

The Weekly Gazette
LaGrange, N. C.

Greene Co. Ledger
Snow Hill, N. C.

The Chronicle
Pink Hill, N. C.

Town And Country
News

Wayne and Lenoir
Editions

March 7, 1963

News Art by Mar 16

Mr. David Weaver
N. C. State College
Raleigh, North Carolina

Dear Mr. Weaver:

I am preparing my annual Farm Edition and would appreciate very much an article from you on the outlook in agriculture.

I would appreciate you thinking along the lines of what farmers can expect in the way of changes in the years which lie immediately ahead.

Thanking you for your cooperation I remain,

Very truly yours,

Paul A. Barwick
Paul A. Barwick

PAB:ss

P. S. I need the article in my office by March 16 if at all possible.

OFFSET
PRODUCTION

The News and Observer

BILL HUMPHRIES, Farm Editor

Raleigh, N. C.

D-R Feb 5

January 17, 1963

Mr. D. S. Weaver
School of Agriculture
North Carolina State College
Raleigh, North Carolina

Dear Mr. Weaver:

For our annual farm edition, to be published next month, we have chosen the theme "Agriculture in Transition"--sort of a look backward and a look forward at the same time.

We would like to ask you to prepare us an article along the lines of "A Peek into the Future: What Will Farming Be Like in 1973?" Or 1983? Or 1988?

Deadline is Feb. 5. Suggested length is 600 to 800 words--three to four typed pages, double-spaced.

We certainly hope you can prepare the article for us. If so, I'm sure it would be most interesting.

Please let me know whether you can do this.

Sincerely,

Bill Humphries

NORTH CAROLINA STATE COLLEGE
SCHOOL OF AGRICULTURE • RALEIGH, N. C.

OFFICE OF THE DEAN AND DIRECTORS

January 18, 1963

Mr. Bill Humphries, Farm Editor
The News & Observer
Raleigh, North Carolina

Dear Bill:

Acknowledging receipt of your request for a 600 to 800 word article
for your annual farm edition, by agreeing to write it!

Will have it in your hands by February 5, 1963.

Sincerely,

David S. Weaver
Special Assistant to Dean of Agriculture

DSW:1b