PROCEEDINGS

1976 BEEF INDUSTRY CONFERENCE

December 15-16, 1976

Sponsored by

Auburn University Alabama Cattlemen's Association Allied Industry

P R O C E E D I N G S

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B E E F I N D U S T R Y C O N F E R E N C E

Beef Production for the Late 70's

December 15-16, 1976

Haley Center
Auburn University
Auburn, Alabama

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PROGRAM
December 15

A.M.

8:00 · All Exhibits Open

Registration - Conference Lobby

Beef Production for the Late Seventies

W. M. Warren - Presiding

10:00 Welcome Address - Dr. Ben T. Lanham, Auburn University

Response - E. H. "Ham" Wilson, Alabama Cattlemen's Association

Response - W. M. "Bill" Brown, Representative of Allied Industries

10:30 Keynote Address - Animal Agriculture and Our National Welfare - Dr. Roy M. Kottman, Ohio State University

11:15 Livestock Research - We Accept the Challenge - Dr. Stanley Wilson, Auburn University

11:35 Dissemination of Research Information - We Accept the Challenge - Dr. J. Michael Sprott

12:00 Lunch - War Eagle Cafeteria - Union Building

Carrying Calves to Heavier Weights

Robert L. McGuire - Presiding

P.M.

1:00 The Topic - Dr. Robert L. McGuire

The Program in Practice

Producer - Clint Hardin, Lawrence County

Veterinarian - Dr. J. Lee Alley, Montgomery

Assistant County Agent - Mike Davis, Houston County Extension Service

Extension Nutritionist - Dr. B. G. Ruffin, Auburn University

Extension Agronomist - Dr. Donald Ball, Auburn University

2:30 Questions and Answers

2:45 Break

3:15 Recent Research

Controlled Grazing - Dr. R. R. Harris

Feeding on Grazing - L. A. Smith

New Grazing Crops - Dr. Carl Hoveland

4:00 Poultry Litter in Cattle Feeding - Dr. Joe P. Fontenot

4:45 Exhibits Open

E. H. "Ham" Wilson - Presiding

7:00 Banquet - Union Ballroom

Elanco Beef Efficiency Award - Ted Kreutter

Film - "Food Prices Too High, Compared to What" featuring the late Jerry Litton, Congressman from Missouri

Remarks - Dr. R. Dennis Rouse

December 16

A.M.

8:00 Exhibits Open

Marketing

Robert L. McGuire - Presiding

8:30 Organized Cattle Marketing - K. C. Williamson

9:15 Selling Feeders Dixie Style

Harold Johnson - Producer, Tallapoosa County

John Trotman - Producer and Order Buyer, Montgomery

Dan Linton - Auburn University

10:00 Break

W. M. Warren - Presiding

10:30 Using All at Your Command

Feed Additives - Dr. R. R. Harris

Growth Stimulants - Dr. B. G. Ruffin

Crop Residues - Dr. W. B. Anthony

11:00 Cattle Outlook - Dr. Kary Mathis

11:45 Answers to Your Questions

12:00 Barbecue Lunch (Dutch) - Livestock Arena

P.M.

1:30 On-the-Farm Performance Tested Bull Sale - Dr. R. E. Deese

ANIMAL AGRICULTURE AND OUR NATIONAL WELFARE

ROY M. KOTTMAN

DEAN, COLLEGE OF AGRICULTURE AND HOME ECONOMICS
THE OHIO STATE UNIVERSITY
DIRECTOR, OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
DIRECTOR, OHIO COOPERATIVE EXTENSION SERVICE

I AM PLEASED TO APPEAR ON THIS PROGRAM BECAUSE YOU FOLKS IN ALABAMA HAVE DONE A REMARKABLY GOOD JOB OF INCREASING BOTH THE NUMBER OF BROOD COWS IN YOUR STATE AND OF FEEDING OUT MORE OF THE CALVES YOU PRODUCE. BACK IN 1955, YOU HAD 672,000 BEEF BROOD COWS IN YOUR STATE AND AS OF 1975 YOU HAD A 1,238,000 BROOD COWS ON YOUR FARMS. ALTHOUGH I WAS NOT ABLE TO FIND ANY PRECISE DATA, THE BEST ESTIMATES I HAVE FOUND SUGGEST THAT DURING 1975, ALABAMA FEEDER CALF PRODUCERS SHIPPED THREE-QUARTERS OF A MILLION HEAD OF FEEDER CALVES TO CATTLE FEEDERS IN OTHER STATES. THOSE SAME ESTIMATES INDICATE THAT YOU ARE NOW FEEDING OUT CLOSE TO A HALF MILLION CATTLE EACH YEAR. I REALLY DON'T LIKE TO ADMIT IT, BUT YOU FOLKS HAVE A TERRIFIC ADVANTAGE OVER OUR BEEF CATTLE PRODUCERS IN THE CORN BELT. I SAY THAT BECAUSE THE AVERAGE VALUE OF YOUR FARM LAND IN 1976 IS $425, WHEREAS IN OHIO THE AVERAGE VALUE OF LAND IN 1976 IS $870 PER ACRE. INTERESTINGLY ENOUGH, I BELIEVE THAT YOU CAN PRODUCE MORE GRASS AND FORAGE PER ACRE HERE IN ALABAMA THAN WE CAN IN OHIO. THIS MEANS THAT YOU DO HAVE MUCH LOWER CAPITALIZATION PER BROOD COW THAN WE HAVE IN OHIO AND THROUGHOUT THE CORN BELT.

I HAVE TITLED MY REMARKS "ANIMAL AGRICULTURE AND OUR NATIONAL WELFARE" BECAUSE I AM CONVINCED THAT MALNUTRITION WOULD BE RAMPANT IN OUR NATION IF WE HAD TO GET ALONG WITHOUT MEAT, MILK AND EGGS. ONE OF THE INTERESTING AND CHALLENGING ASPECTS OF LIVESTOCK PRODUCTION IS ITS DIVERSITY. ONE OF OUR MOST SUCCESSFUL BEEF CATTLE PRODUCERS IN THE HILL COUNTRY OF SOUTHEAST OHIO UTILIZES A SYSTEM WHICH IS SUCCESSFUL ONLY BECAUSE HIS WIFE IS WILLING TO WORK 12 HOURS A DAY AND SHE HAS TREMENDOUS ABILITY TO RAISE CALVES. THIS ELDERLY FARM COUPLE BUYS BABY CALVES WHEN THEY ARE ANYWHERE FROM ONE DAY TO TEN DAYS OLD AND SUCKLES THEM ON DAIRY COWS (THREE OR FOUR CALVES TO EACH COW) WITH THE RESULT THAT THE BABY CALVES NEVER LOSE THEIR MILK FAT. ALL OF THE CALVES ARE PROVIDED "TENDER LOVING CARE" FROM THE DAY THEY ARRIVE AT THE FARM UNTIL THEY ARE SOLD WEIGHING 1,200 POUNDS SOME TWO YEARS LATER. THIS 600 ACRE FARM SUPPORTS SEVERAL HUNDRED CATTLE OF ALL AGES WITH THE PRINCIPLE FEED BEING ORCHARD GRASS PASTURE AND HAY, PLUS CORN SILAGE, TOPPED OFF BY A 140-DAY GRAIN FEEDING PERIOD WHICH INCLUDES SIZEABLE AMOUNTS OF CORN SILAGE. THE SUCCESS OF THIS FAMILY FARM ON BASICALLY UNPRODUCTIVE HILL LAND DEPENDS ON OPTIMUM USE OF FERTILIZER AND LIME TO GROW PASTURE, HAY AND CORN SILAGE. THIS FAMILY EMPLOYS ONE HIRED MAN THE YEAR AROUND, PLUS A PART-TIME MAN DURING THE BUSY SUMMER MONTHS. IT IS A VERY UNIQUE SYSTEM, BUT IT KEEPS THEM MAKING MONEY IN SPITE OF THE COST-PRICE CRUNCH THAT OUR BEEF INDUSTRY HAS EXPERIENCED IN RECENT YEARS.

YET ANOTHER RATHER UNIQUE BEEF FEEDING OPERATION IN MY STATE INVOLVES A CATTLE FEEDER LOCATED 30 MILES SOUTH OF

COLUMBUS, OHIO, WHO UTILIZES STALE COOKIES AND CRACKERS ALONG WITH OTHER TYPES OF REJECT MATERIAL FROM ONE OF THE LARGE BAKERIES IN OUR CITY. AS WITH SO MANY FEEDSTUFFS WHICH RUMINANT ANIMALS CAN UTILIZE, THIS CATTLE FEEDER IS ABLE TO BUY CARBOHYDRATES, FAT AND PROTEIN AT A RELATIVELY CHEAP PRICE SIMPLY BECAUSE THOSE BY-PRODUCTS AND WASTE MATERIALS ARE OF NO VALUE TO THE BAKERY.

ONE OF THE VERY BEST WAYS THAT OUR OHIO CALF PRODUCERS HAVE FOUND TO SAVE LABOR AND TO REDUCE THE COST OF PRODUCTION HAS INVOLVED IMPROVEMENT OF PASTURES BY UTILIZING NO-TILL SEEDERS WHICH INTERSEED IMPROVED GRASSES AND/OR ALFALFA INTO ESTABLISHED STANDS OF BLUEGRASS, ORCHARD GRASS OR UNIMPROVED BROMESEDGE PASTURES. ON MUCH OF THE LAND IN THE 28 COUNTIES OF OHIO WHICH ARE UNGLACIATED IT DOESN'T MAKE SENSE TO PUT A PLOW TO THE STEEP SLOPES. THE NO-TILL SEEDER PROVIDES A READY-MADE ANSWER TO THOSE EROSION PROBLEMS WHICH IN YEARS PAST HAVE DENUDED OUR HILL COUNTRY OF MUCH OF ITS ORIGINAL TOPSOIL.

YEAR-'ROUND GRAZING, ALONG WITH USE OF ROUND BALES AND ELECTRIC FENCE, HAS MADE IT POSSIBLE FOR OUR COW-CALF MEN TO HOLD DOWN COSTS AND AT THE SAME TIME IMPROVE HERD HEALTH AND PRODUCE HEAVIER CALVES AT WEANING.

IN JANUARY, 1974, WE LAUNCHED A NEW BEEF PRODUCTION DEMONSTRATION PROGRAM IN OHIO. WE CALL IT THE FERTIBULL DEMONSTRATION PROGRAM. THE WHOLE IDEA IS TO DEMONSTRATE HOW WE CAN OPTIMIZE USE OF LIME AND FERTILIZER, ALONG WITH NO-TILL SEEDED IMPROVED GRASSES AND LEGUMES, PLUS IMPROVED BREEDING STOCK, TO ACHIEVE 90 PERCENT OR HIGHER CALF CROPS THAT WILL

WEIGH 500 POUNDS OR MORE AT 205 DAYS OF AGE. SINCE THESE FERTIBULL FARMS ARE DEMONSTRATION UNITS, WE START OUT WITH JUST ONE BULL (OR PROVISION FOR ARTIFICAL INSEMINATION) AND 25 BROOD COWS. WE ASK THE FARMER-DEMONSTRATOR TO SET ASIDE A MINIMUM OF 60 ACRES OF FORAGE LAND (OR ENOUGH ACRES TO MEET FEED REQUIREMENTS OF 8 TONS OF FORAGE PER ANIMAL GRAZING UNIT). EACH DEMONSTRATOR SIGNS AN AGREEMENT THAT HE WILL DO THE FOLLOWING THINGS:

1. ENROLL IN OUR OHIO BEEF PRODUCTION TESTING PROGRAM.
2. USE A RECOMMENDED MINERAL MIXTURE.
3. CONSTRUCT OR PURCHASE THE PENS, CHUTES, GATES AND HANDLING EQUIPMENT THAT WE RECOMMEND TO HIM.
4. COMPLY WITH ALL RECOMMENDED PRACTICES RELATIVE TO CASTRATING, DEHORNING, VACCINATING, SPRAYING AND IDENTIFYING HIS CALVES BY EAR TAG AND TATTOO.
5. COMPLY WITH SOIL TEST RESULTS IN APPLYING LIME AND FERTILIZER, AND SEED RECOMMENDED PASTURE GRASSES AND LEGUMES.

OUR COUNTY AGENTS HAVE THE PRINCIPAL RESPONSIBILITY OF NOMINATING PARTICIPANT-DEMONSTRATORS WHO WILL TAKE PART IN THIS DEMONSTRATION PROGRAM. EACH DEMONSTRATION FARMER SIGNS A "COOPERATIVE AGREEMENT" TO FULFILL ALL OF HIS OBLIGATIONS AS SPECIFIED IN THE AGREEMENT. THE DEMONSTRATOR AGREES ALSO TO A GREAT MANY OTHER THINGS INCLUDING PERMISSION FOR THE EXTENSION SERVICE TO MAKE PERIODIC VISITS TO HIS FARM AND TO ARRANGE FOR MEETINGS AND TOURS ON THE FARM IN ORDER TO ACQUAINT PEOPLE WITH RESULTS OF THE FERTIBULL DEMONSTRATION PROGRAM.

As we all know so well, the last two years have been the worst possible time to launch any type of program which depends on beef producer support for its success. In spite of the depressed prices our cooperators have received for their feeder calves, we have observed a good deal of enthusiasm for this program. As you would be well aware, the major thrust of this program is to demonstrate the feasibility of maximizing forage production in order to make feeder calf production profitable in Ohio. The optimal use of lime and fertilizer along with improved breeding stock, primarily the use of better bulls, led us to coin the word "Fertibull" which is, indeed, a key word in developing the potential of feeder calf production in our Buckeye State.

I should indicate to you that the Ohio Cooperative Extension Service seeks out sponsors who provide lime and fertilizer to bring the soil on each of the designated 60 acre units up to top fertility levels. In addition, the sponsors provide approximately one-half of the annual maintenance applications needed for each of the four years following initial application of lime and fertilizer. In addition, we enlist the help of a local sponsor who assists the farmer-demonstrator in upgrading the genetic potential of his beef herd in one of the following ways: (a) provide a cash contribution not to exceed $500 the first year and $500 the third year of the project toward the purchase of performance-tested bulls, or (b) pay one-half the cost of AI semen (not to exceed $200 per year) over the five-year period, or (c) utilize a lease agreement to provide the

DEMONSTRATOR WITH TWO OR MORE PERFORMANCE-TESTED BULLS DURING THE FIVE-YEAR PROJECT, WITH TOTAL COST TO THE SPONSOR NOT TO EXCEED THOSE COSTS THAT WOULD BE INCURRED IN DIRECT PURCHASE OF THE BULLS OR IN PURCHASE OF SEMEN.

EACH COOPERATOR IS HEAVILY SUBSIDIZED BY OFF-FARM AGRIBUSINESS FIRMS AND BY THE PUREBRED LIVESTOCK INDUSTRY IN OUR STATE. WE CURRENTLY HAVE 14 OF THESE FERTIBULL DEMONSTRATION FARMS LOCATED IN VARIOUS AREAS OF OUR STATE, WITH HEAVIEST CONCENTRATION IN THE HILL COUNTRY OF THE 28 UNGLACIATED COUNTIES OF SOUTHEAST OHIO. DURING THE FIRST TWO YEARS, TWO OF OUR COOPERATORS HAD 100 PERCENT CALF CROPS BUT WE HAD SOME AS LOW AS 50 PERCENT. THE AVERAGE PERCENTAGE OF CALVES WEANED FROM COWS BRED WAS 84 PERCENT. AVERAGE WEANING WEIGHT FOR THE FIRST TWO YEARS WAS 382 POUNDS. WE ARE NOT VERY PROUD OF THOSE RECORDS, BUT FOR THE CURRENT YEAR (1976) WE HAVE SEVERAL FERTIBULL HERDS WHICH HAVE ACHIEVED 100 PERCENT CALF CROPS AND WE HAVE SOME HERDS WITH AVERAGE WEANING WEIGHTS OF CLOSE TO 600 POUNDS. THE PROGRESS WHICH HAS BEEN MADE BY OUR FERTIBULL COOPERATORS IS RATHER REMARKABLE. ONLY ONE OF THE ORIGINAL 15 HAS DROPPED OUT OF THE PROGRAM AND WE HAVE QUITE A NUMBER OF FARMERS WHO ARE ON THE WAITING LIST TO BE INCLUDED IN THE PROGRAM. ON SEVERAL FARMS WE HAVE FOUND IT TO BE POSSIBLE FOR THE FARMER TO CARRY 40 COWS AND THEIR CALVES ALONG WITH THE BULL POWER NEEDED AND PROVIDE ALL THE FEED NEEDED, WINTER AND SUMMER, ON JUST 60 ACRES.

WE CONTINUE TO BE OPTIMISTIC ABOUT THE LIVESTOCK INDUSTRY IN OHIO AND ESPECIALLY ABOUT OUR BEEF CATTLE INDUSTRY. WE HAVE JUST COMPLETED A NEW $378,000 BULL-TESTING FACILITY WHICH

WILL BE OPERATED BY THE OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER AND THE OHIO COOPERATIVE EXTENSION SERVICE. IT IS LOCATED IN THE HEART OF OUR HILL COUNTRY IN SOUTHEAST OHIO AND HAS CAPACITY FOR 200 BULLS. ON NOVEMBER 15, WE CHECKED IN 193 BULLS FOR THE FIRST YEAR OF THIS BEEF CATTLE PERFORMANCE TESTING PROGRAM. WE BELIEVE THAT MANY FARMERS IN OUR STATE HAVE A LONG WAY TO GO IN TERMS OF IMPROVING THE GROWTH RATE OF THE CALVES THEY ARE PRODUCING WHICH MEANS, OF COURSE, THAT THEY HAVE TO IMPROVE THE MILKING ABILITY OF THEIR BROOD COW HERD AND DO A LOT OF OTHER THINGS BY WAY OF PERFORMANCE EVALUATION WHICH WILL BRING CONTINUED IMPROVEMENT TO THEIR HERDS. I WOULD LIKE ALL OF YOU TO VISIT OUR EASTERN OHIO RESOURCE DEVELOPMENT CENTER ON APRIL 25, AT WHICH TIME WE WILL HAVE THE FIRST PERFORMANCE TESTED BULL SALE AT OUR NEW BULL-TEST FACILITY. WE HAVE A LARGE ENCLOSED SALES ARENA AND EXCELLENT FACILITIES FOR FEEDING AND HANDLING THE BULLS.

I AM SURE THAT THE RESEARCH BEING DONE AT AUBURN AND AT THE OUTLYING FIELD STATIONS OF YOUR ALABAMA AGRICULTURAL EXPERIMENT STATION, ALONG WITH THE WORK BEING CARRIED OUT BY YOUR EXTENSION AGENTS IN ALABAMA, OFFERS YOU FOLKS THE SAME KIND OF UP-TO-DATE RESEARCH INFORMATION THAT WE OFFER OUR BEEF CATTLE PRODUCERS IN OHIO. I CONFESS THAT I AM MUCH MORE CONCERNED ABOUT SOME OF THE OUTSIDE INFLUENCES ON OUR LIVESTOCK INDUSTRY THAN I AM ABOUT OUR BEING ABLE TO PROVIDE CATTLEMEN WITH THE RESEARCH INFORMATION AND EXTENSION ASSISTANCE WHICH WILL HELP THEM TO MAKE THE ADAPTATIONS AND ADJUSTMENTS NECESSARY TO KEEP IN BUSINESS DESPITE THE UPS AND DOWNS OF THE MARKET PLACE. ONE OF THE THINGS THAT CONCERNS ME A GREAT DEAL IN

OHIO IS THE FEELING THAT THE RELATIVELY HIGH PRICES FOR GRAIN DURING THE LAST THREE YEARS ARE GOING TO CONTINUE. THE FACT OF THE MATTER IS, OF COURSE, THAT OUR MARKET FOR WHEAT IS ALREADY DEPRESSED AND OUR CORN MARKET IS NOT A WHOLE LOT BETTER. IF WE HAVE ANOTHER REASONABLY GOOD YEAR OF CROP PRODUCTION HERE IN THE UNITED STATES, COUPLED WITH A DECENT YEAR OF CROP PRODUCTION THROUGHOUT EUROPE AND THE SOVIET UNION, I AM AFRAID THAT WE ARE GOING TO BE BACK ABOUT WHERE WE WERE WITH GRAIN PRICES PRIOR TO THE FIRST RUSSIAN GRAIN SALES.

I RECENTLY PICKED UP SOME DATA FROM AN ANALYSIS OF SELECTED FARMS MANAGED BY THE COMMERCIAL NATIONAL BANK OF PEORIA, ILLINOIS, WHEREIN GRAIN FARMS AND LIVESTOCK FARMS WERE COMPARED ALONG WITH THOSE WHEREIN PART OF THE CROP WAS SOLD FOR CASH AND PART OF IT FED TO LIVESTOCK. ON THE GRAIN FARMS THE AVERAGE NET RETURN PER CROP ACRE FROM 1971 THROUGH 1975, WAS $71.92. ON THE FARMS WHERE PART OF THE CROPS WERE SOLD FOR CASH AND PART FED TO LIVESTOCK, THE NET RETURNS PER CROP ACRE AVERAGED $75.43. ON THE LIVESTOCK FARMS, WHERE ALL OF THE CROPS WERE FED TO LIVESTOCK, THE FIVE-YEAR AVERAGE RETURN PER CROP ACRE WAS $155.34. ADVANTAGE OF THE LIVESTOCK FARMS OVER THE STRICTLY GRAIN FARMS DURING THE MOST RECENT FIVE YEARS AMOUNTED TO AN AVERAGE OF $83.42 PER ACRE; WHEREAS THE ADVANTAGE BETWEEN THE LIVESTOCK FARMS AND THE MIXED LIVESTOCK AND CROP FARMS WAS $79.91 PER ACRE. THESE DATA SUGGEST TO ME THAT EVEN DURING THE HIGH PRICES WE HAVE HAD FOR CROPS OVER THREE OF THE LAST FIVE YEARS THERE IS STILL MUCH TO BE SAID FOR MARKETING OUR CROPS THROUGH LIVESTOCK. NOW I REALIZE THAT THE MAJORITY OF THOSE ILLINOIS FARMS WERE PROBABLY SWINE FARMS BECAUSE THERE ARE A LOT OF HOGS PRODUCED

AROUND PEORIA. AT THE SAME TIME, WHEN WE CONSIDER LONG-TERM TRENDS, THERE WILL BE SIMILAR ADVANTAGES FOR BEEF CATTLE. WHAT CONCERNS ME MORE THAN THE ECONOMICS OF LIVESTOCK PRODUCTION, HOWEVER, ARE THE ROAD-BLOCKS OF EMOTIONAL AND POLITICAL CONSTRAINT WHICH ARE BEING PLACED ON OUR LIVESTOCK INDUSTRY. I AM NOT VERY HAPPY ABOUT THE FACT THAT OUR ANNUAL IMPORTS OF BEEF ARE NOW MORE THAN SIX TIMES AS HIGH AS THEY WERE JUST 20 YEARS AGO. WE ARE CURRENTLY IMPORTING TWICE AS MUCH BEEF ANNUALLY AS WE IMPORTED JUST 10 YEARS AGO. I THINK THERE HAS TO BE SOME POINT AT WHICH WE ACHIEVE A MORE REALISTIC CONTROL OVER BEEF IMPORTS. IT REALLY DOESN'T MAKE MUCH SENSE TO INCREASE BEEF IMPORTS BY SIX TIMES OVER THE SAME 20-YEAR PERIOD THAT OUR BEEF CATTLE POPULATION IN THIS COUNTRY WAS DOUBLING AS IT WENT FROM 61 MILLION HEAD TO 116 MILLION HEAD. IF THE BEEF CATTLE POPULATION OF THIS COUNTRY HAD BEEN DROPPING FROM 116 MILLION HEAD DOWN TO 61 MILLION HEAD DURING THE PAST 20 YEARS THEN THE HUGE INCREASE IN BEEF IMPORTS MIGHT HAVE BEEN JUSTIFIED.

ONE OF THE EMOTIONAL CONSTRAINTS THAT REALLY "BUGS" ME INVOLVES THOSE PEOPLE WHO ARE TRYING TO MAKE US BELIEVE THAT WE HERE IN THE UNITED STATES ARE EVIL AND GLUTTONOUS BECAUSE WE EAT MEAT, MILK AND EGGS RATHER THAN EATING GRAIN CROPS DIRECTLY. LESTER BROWN, WHO NOW IS THE PRESIDENT OF AN ORGANIZATION CALLED "WORLDWATCH INSTITUTE" IN WASHINGTON, D. C., BUT WHO WAS AT ONE TIME WITH THE ECONOMIC RESEARCH SERVICE OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, SUGGESTED IN EARLY 1974, THAT BY THE SPRING OF 1975, WE HERE IN THE UNITED STATES WOULD EITHER HAVE TO EAT LESS MEAT OR ELSE "WATCH PEOPLE STARVE TO DEATH ON THE T.V. NEWS." WELL, THE SPRING OF 1975 CAME AND

WENT AND WE DIDN'T HAVE TO WATCH PEOPLE STARVE TO DEATH ON THE T.V. NEWS. AS A MATTER OF FACT PRICES FOR MANY OF OUR FARM COMMODITIES, ESPECIALLY BEEF AND POULTRY HAVE BEEN DEPRESSED DURING EACH OF THE LAST SEVERAL YEARS BECAUSE THERE WAS NOT SUFFICIENT MARKET DEMAND TO SUSTAIN THE COST OF PRODUCTION FOR THOSE PRODUCTS.

IT REALLY DISTRESSES ME THAT THERE ARE SO MANY ILL-ADVISED AND POORLY INFORMED SPEAKERS AND WRITERS WHO INSIST THAT HERE IN THE UNITED STATES OF AMERICA, WE ARE GOING TO HAVE TO RELY COMPLETELY ON NON-ANIMAL PROTEIN FOR OUR SUPPLY OF FOOD IN THE YEARS AHEAD. IT MAY BE MORE THAN COINCIDENCE THAT MANY OF THOSE FOLKS ARE THE SAME PEOPLE WHO HAVE BEEN MOST ACTIVE IN EFFORTS TO DENY US THE USE OF DES, DDT, ALDRIN AND DIELDRIN. THEY ARE OFTEN THE SAME PEOPLE AS THOSE WHO ARE BENT ON DENYING US THE USE OF ANTIBIOTICS AND FEED ADDITIVES WHICH HAVE BEEN DEMONSTRATED TO IMPROVE THE EFFICIENCY OF LIVESTOCK AND POULTRY PRODUCTION. I OFTEN WONDER HOW MUCH LONGER WE CAN TOLERATE THE HOARD OF DETRACTORS WHO WANT TO DENY US THE RESULTS OF SCIENTIFIC INVESTIGATION AND CLAMOR INSTEAD FOR RESTRICTIONS AND OUTRIGHT BANS ON GOOD AND USEFUL PRODUCTS WHOSE ONLY FAULT SEEMS TO LIE IN THEIR POSITIVE CONTRIBUTION TO PROGRESS AND PROSPERITY FOR THE UNITED STATES OF AMERICA! CONSUMER ADVOCATES CONTINUE TO DEMAND ZERO TOLERANCE WHEN "ZERO" DOES NOT HAVE THE SAME MEANING FROM YEAR TO YEAR AS OUR SCIENTIFIC INSTRUMENTATION BECOMES MORE AND MORE SENSITIVE. THE UNWILLINGNESS OF THE SO-CALLED CONSUMER ADVOCATES TO BALANCE BENEFIT AGAINST RISK DOES INDEED SERVE AS A MOST EFFECTIVE CONSTRAINT ON PROFITABLE LIVESTOCK PRODUCTION AND INDEED ON THE TOTAL SUPPLY OF FOOD FOR OUR NATION.

ONE OF THE BEST REBUTTALS THAT I HAVE YET SEEN TO THOSE WHO WOULD TRY TO MAKE US BELIEVE THAT THERE IS SOMETHING EVIL ABOUT EATING MEAT WAS WRITTEN BY GORDON VANVLECK, WHO AS PRESIDENT OF THE AMERICAN NATIONAL CATTLEMAN'S ASSOCIATION, WROTE AN ARTICLE WHICH APPEARED IN THE SPRING, 1975, ISSUE OF THE PROFESSIONAL NUTRITIONIST. MR. VANVLECK POINTED OUT AND I QUOTE: "FEED FOR BEEF CATTLE CONSISTS ALMOST ENTIRELY OF ROUGH, FIBROUS MATERIALS, SUCH AS GRASS AND FORAGE, WHICH MAN CAN'T EAT; AND COARSE FEED GRAINS WHICH MOST PEOPLE WON'T EAT, OR DON'T EAT IN SIGNIFICANT AMOUNTS. ALL BEEF CATTLE, EVEN INCLUDING FEEDLOT CATTLE WHICH ARE GRAIN FED PRIOR TO MARKETING GET BY FAR MOST OF THEIR TOTAL FEED NEEDS FROM OTHERWISE WASTED GRASS AND ROUGHAGE." END OF QUOTE. AS A MATTER OF RECORD, USDA DATA FOR 1973, SUGGESTS THAT 53.9 PERCENT OF THE NUTRIENTS FED TO OUR NATION'S BEEF CATTLE CAME FROM PASTURE AND RANGE; 23.7 PERCENT FROM HARVESTED FORAGES; 1.5 PERCENT FROM HIGH PROTEIN SUPPLEMENTS; 1.1 PERCENT FROM BY-PRODUCTS AND 19.8 PERCENT FROM GRAIN.

MR. VANVLECK WENT ON TO POINT OUT IN HIS 1975 ARTICLE THAT: "OUT OF THE 2.2 BILLION ACRES OF LAND IN THE U.S., ONLY ABOUT 15 PERCENT IS SUITABLE FOR THE PRODUCTION OF CULTIVATED CROPS. MORE THAN 80 PERCENT OF THE LAND CANNOT BE USED TO GROW GRAIN AND OTHER CROPS. IF IT ISN'T ALREADY OCCUPIED BY PEOPLE OR FORESTS, IT IS TOO ROUGH, TOO DRY, OR TOO INFERTILE TO GROW GRAIN CROPS. HOWEVER, ABOUT HALF OF THIS NON-CROP LAND--SOME 900 MILLION ACRES--DOES GROW GRASS WHICH CAN BE CONVERTED INTO HUMAN FOOD BY RUMINANT ANIMALS. THESE 900 MILLION ACRES WOULD GO TO WASTE AS A RENEWABLE RESOURCE WERE IT NOT FOR RUMINANTS.

"CATTLE ALSO MAKE USE OF MILLIONS OF TONS OF CROP RESIDUES AND FOOD PROCESSING BY-PRODUCTS WHICH OTHERWISE WOULD REPRESENT DISPOSAL AND POLLUTION PROBLEMS.

"AT LEAST 40 PERCENT OF OUR TOTAL U.S. BEEF PRODUCTION IS NOW COMING FROM NON-GRAIN-FED CATTLE. THIS INCLUDES COWS, CALVES AND OTHER CATTLE WHICH HAVE NOT BEEN IN FEEDLOTS AND WHICH HAVE RECEIVED LITTLE OR NO GRAIN PRIOR TO MARKETING." END OF QUOTE. THOSE ARE TELLING ARGUMENTS BUT THE NEXT STATEMENT BY MR. VANVLECK IS REALLY THE "CLINCHER," AND I QUOTE:

"CATTLEMEN DO NOT OPPOSE ANYONE'S PURCHASING FEED GRAIN FOR HUMAN FOOD OR ANY OTHER USE. IT IS AVAILABLE FOR PURCHASE BY FOREIGN COUNTRIES, BY FOOD PROCESSORS, BY FEED MANUFACTURERS, BY THE U.S. GOVERNMENT, BY CHARITABLE GROUPS, OR BY ANIMAL FEEDERS. HOWEVER, PHYSICAL AND NUTRITIONAL CHARACTERISTICS OF FEED GRAINS (FIELD CORN, GRAIN SORGHUM, BARLEY AND OATS) LIMIT THEIR USE IN HUMAN FOOD. EVEN MUCH OF OUR CORN IS NOT OF A GRADE SUITABLE FOR PROCESSING INTO HUMAN FOOD. JUST AS WITHIN THE U.S., MOST OF THE FEED GRAIN SHIPPED OVERSEAS IS USED FOR ANIMAL FEEDING.

"EVEN IF MORE PEOPLE WOULD EAT COURSE GRAINS SUCH AS GRAIN SORGHUM AND FIELD CORN, SOMEONE (THE IMPORTING NATION, U.S. TAXPAYERS OR CHARITABLE ORGANIZATIONS) STILL WOULD HAVE TO BUY AND DISTRIBUTE THEM. WITHOUT EFFECTIVE DEMAND, THE GRAIN WILL NOT BE PRODUCED. GRAIN FARMERS CANNOT PRODUCE THE GRAIN AND GIVE IT AWAY. SOMEONE HAS TO PAY FOR IT..." END OF QUOTE.

BUT IT IS NOT ONLY THE CLAMOR OF "USING THE POOR MAN'S GRAIN TO FEED THE RICH MAN'S COW" WHICH PROVIDES EMOTIONAL

CONSTRAINT TO MAXIMUM LIVESTOCK PRODUCTION. IT IS OF EVEN GREATER CONCERN, PERHAPS, THAT OUR U.S. ANIMAL INDUSTRY HAS BEEN LITERALLY "CLOBBERED" THROUGHOUT MOST OF THE PERIOD SINCE THE END OF WORLD WAR II, BY A SIZEABLE GROUP OF PEOPLE (INCLUDING SOME PHYSICIANS) WHO HAVE ADVOCATED LOWER CONSUMPTION OF ANIMAL PRODUCTS. THE RATIONALE OF THOSE ANIMAL INDUSTRY DETRACTORS CAN BE SUMMARIZED SOMEWHAT AS FOLLOWS:

> SINCE A HIGH PROPORTION OF ANIMAL FATS ARE THE SO-CALLED SATURATED FATS, AND SINCE THEY CONTAIN VARYING AMOUNTS OF CHOLESTEROL, ALL ANIMAL PRODUCTS ARE <u>SUSPECT</u> AS BEING CONTRIBUTORS TO HEART AND CIRCULATORY DISEASES.

THAT IS THE USUAL ALLEGATION. FORTUNATELY, IT DOESN'T HOLD UP VERY WELL UNDER CLOSE SCRUTINY BECAUSE EVEN AFTER TWO DECADES OF NATIONWIDE PUBLICITY DESIGNED TO FOCUS ON CHOLESTEROL AS THE WORD MOST CLOSELY ASSOCIATED WITH CIRCULATORY DISORDERS, AND AFTER YEARS OF RESEARCH, THERE IS <u>STILL NO INCONTROVERTIBLE EVIDENCE</u> OF A CAUSE-AND-EFFECT RELATIONSHIP BETWEEN HEART DISEASE AND HUMAN CONSUMPTION OF ANIMAL PRODUCTS.

THE OCTOBER 25, 1976 EDITION OF THE "JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION" CONTAINS A REPORT WHICH INVOLVED VIRTUALLY THE ENTIRE ADULT POPULATION OF THE TOWN OF TECUMSEH, MICHIGAN. AS REPORTED IN THE "MEAT BOARD REPORTS" NEWSLETTER OF THE NATIONAL LIVESTOCK AND MEAT BOARD (VOL. IX, NO. 20, MONDAY, NOVEMBER 8, 1976):

"ALLEN B. NICHOLS, M.D., UNIV. OF MICH. SCHOOL OF MEDICINE AND COLLEAGUES CONDUCTED STUDY. CONSUMPTION OF 110 DIFFERENT FOOD ITEMS, BOTH HIGH AND LOW IN FATS AND SUGAR, WAS TABULATED FOR 4,057 ADULTS. LEVELS OF BLOOD FATS WERE MEASURED. THEY

FOUND NO SIGNIFICANT ASSOCIATION BETWEEN SERUM LIPID (BLOOD FATS) LEVELS AND THE FREQUENCY OF CONSUMPTION OF FAT, SUGAR, STARCH, ALCOHOL AND TEA FOR BOTH MEN AND WOMEN...BUT SERUM CHOLESTEROL, TRIGLYCERIDE CONCENTRATIONS SIGNIFICANTLY HIGHER AMONG MEN, WOMEN WHO WERE MARKEDLY OVERWEIGHT.

"'THE CONSISTENT LACK OF CORRELATION BETWEEN NUTRITIONAL COMPOSITION OF THE INDIVIDUAL'S DIET AND SERUM CHOLESTEROL REPORTED BY ALL LARGE DIETARY SURVEYS PERFORMED BY VARIOUS METHODS IN DIFFERENT POPULATIONS PROVIDES EVIDENCE THAT OTHER FACTORS BESIDES FAT ARE DETERMINANTS OF CHOLESTEROL LEVELS AMONG THE GENERAL PUBLIC,' SAYS DR. NICHOLS.

"HOWEVER, HE CAUTIONS THAT THE APPARENT INDEPENDENCE OF DIETARY HABITS AND SERUM LIPID LEVELS DOES NOT MEAN THAT DIET AND LIPID LEVELS ARE UNRELATED. BUT DEGREE OF OBESITY IS MORE OBVIOUSLY RELATED TO SERUM LEVELS THAN THE PARTICULAR DIET, HE SAYS.

"THE NICHOLS GROUP MADE AN EXTREMELY SIGNIFICANT OBSERVATION ABOUT POPULATION STUDIES (MANY OF WHICH HAVE BEEN USED BY AMERICAN HEART ASSN., OTHERS TO SUPPORT CONCEPT THAT DIET IS A MAJOR FACTOR IN CHOLESTEROL-HEART DISEASE): 'THE LACK OF ASSOCIATION BETWEEN DIETARY VARIABLES AND SERUM CHOLESTEROL LEVELS OBSERVED IN THIS STUDY HAS BEEN REPORTED IN ALL OTHER LARGE EPIDEMIOLOGICAL DIETARY SURVEYS IN WHICH INTAKE FOR INDIVIDUALS WAS MEASURED RATHER THAN MEAN INTAKE OF WHOLE POPULATIONS.' CITED SEVERAL SPECIFIC STUDIES, INCLUDING FRAMINGHAM, THAT 'SHOWED NO SIGNIFICANT POSITIVE CORRELATIONS BETWEEN DIETARY INTAKE AND SERUM CHOLESTEROL FOR INDIVIDUALS.'"

DR. MARK ALTSCHULE, EDITOR-IN-CHIEF OF "MEDICAL COUNTER-POINT" MAGAZINE, HAS ON SEVERAL OCCASIONS POINTED OUT THAT OUR FURRY, FOUR-FOOTED FRIENDS, BOTH IN NATURE, AND IN THE ZOOS, HAVE BEEN TRYING FOR YEARS TO TELL US THAT DIET HAS NOTHING TO DO WITH ATHEROSCLEROSIS. SEVERE ATHEROSCLEROSIS APPEARS IN VEGETARIAN BIRDS AND FISH AND IN PLANT-EATING SEALS, WHEREAS ONLY MILD OR TRIVIAL ATHEROSCLEROSIS DEVELOPS IN CARNIVORES THAT GORGE THEMSELVES ON FAT MEAT.

DR. ALTSCHULE HAS STATED THAT THERE IS NO SUBSTANTIAL EVIDENCE THAT CHOLESTEROL IN THE DIET CAUSES ATHEROSCLEROSIS OR ANYTHING ELSE. HE NOTED THAT EXPERIMENTAL WORK WITH DOGS INDICATES THAT A DIET HIGH IN BEEF FAT ACTUALLY PROTECTS AGAINST HEART ATTACKS CAUSED BY ATHEROSCLEROSIS. HE CONCLUDED THAT, AND I QUOTE: "IT APPEARS THAT THE LOW MEAT DIET RECOMMENDED BY SOME PHYSICIANS MAY DO SERIOUS HARM." END OF QUOTE.

GROWING NUMBERS OF MEDICAL AND NUTRITIONAL SCIENTISTS ARE NOW CONCLUDING THAT AT LEAST 25 PERCENT OF ALL HEART ATTACKS ARE OF GENETIC ORIGIN, AND OF THE REMAINING 75 PERCENT, THEY ARE CONCLUDING THAT HEART DISEASE INVOLVES A COMPLEX OF FACTORS, MANY OF WHICH MAY BE AS YET UNIDENTIFIED, AND THAT THE INDICTMENT OF SATURATED ANIMAL FATS APPEARS NOT ONLY TO HAVE BEEN PREMATURE, BUT ALSO QUITE PROBABLY INCORRECT.

I AM CONFIDENT THAT ALL OF YOU IN THIS AUDIENCE ARE STRONG SUPPORTERS OF AGRICULTURAL RESEARCH, AND THERE IS JUST NO QUESTION BUT WHAT WE NEED A GOOD DEAL OF RESEARCH TO HELP US LAY TO REST ANY REMAINING CLAIMS THAT ANIMAL PRODUCTS ARE CULPRITS WITH RESPECT TO ATHEROSCLEROSIS. SIMILARLY, WE NEED

MUCH MORE RESEARCH TO HELP US SOLVE THE PROBLEMS ASSOCIATED WITH LOW REPRODUCTIVE RATES WHETHER CAUSED BY RETAINED PLACENTAS, EMBRYONIC MORTALITY OR DEATH LOSS IN THE NEWBORN CALVES. MOST OF THE ESTIMATES I HAVE SEEN INDICATE THAT THE AVERAGE CALF CROP RAISED IS ABOUT 80 PERCENT. I DOUBT WHETHER IT IS THAT HIGH. WHEN WE PUT THAT FIGURE ON THE BASIS OF CALVES WEANED PER COW BRED, I THINK THE FIGURE WILL BE MUCH LOWER.

THERE IS STILL A GREAT DEAL WHICH NEEDS TO BE DONE TO IMPROVE GROWTH RATE AND FEED EFFICIENCY OF OUR BEEF ANIMALS.

MOST FIGURES WHICH I HAVE SEEN SUGGEST THAT ANYWHERE FROM 8 TO MORE THAN 10 POUNDS OF DIGESTIBLE NUTRIENTS ARE REQUIRED PER POUND OF LIVE WEIGHT GAIN FROM WEANING TO SLAUGHTER. WHEN YOU TIE THOSE FIGURES IN WITH THE 15 TO 25 PERCENT OF CARCASS WEIGHT WHICH IS WASTE FAT, YOU CAN BEGIN TO SEE THAT WE HAVE A GREAT DEAL OF NUTRITION AND MEATS RESEARCH WHICH NEEDS TO BE DONE.

ANOTHER AREA IN WHICH WE NEED TO DO A GOOD BIT MORE WORK IS ON HIGH FORAGE RATIONS, ESPECIALLY ON THOSE WHICH CAN UTILIZE LOW-QUALITY FORAGES. UNFORTUNATELY, THE NON-PROTEIN NITROGEN SOURCES WORK BEST WITH CATTLE ON HIGH-ENERGY RATIONS AND LESS WELL WITH HIGH-FORAGE RATIONS. IN YET ANOTHER AREA, I AM OF THE OPINION THAT WE MUST FIND BETTER WAYS OF UTILIZING BEEF, SWINE, AND POULTRY MANURE ALONG WITH LOW QUALITY ROUGHAGES IN COMBINATION WITH NON-PROTEIN NITROGEN TO CARRY OUR COW HERDS THROUGH THE WINTER AS WELL AS TO PUT WEIGHT ON STOCKER CATTLE.

I HAVE SEEN FIGURES WHICH INDICATE THAT IF WE WERE TO BE SUCCESSFUL IN IMPROVING REPRODUCTION AND FEED EFFICIENCY ALONG WITH ELIMINATING MOST OF THE EXCESS FAT IN BEEF ANIMALS WHILE

AT THE SAME TIME IMPROVING ALL FACETS OF BEEF CATTLE MANAGEMENT, WE COULD REALIZE A 16.5 PERCENT ANNUAL RATE OF RETURN ON THE RESEARCH DOLLARS INVESTED.

I HAVE HEARD ESTIMATES AS HIGH AS $3 BILLION MORE RETURN FOR OUR NATION'S BEEF CATTLE INDUSTRY IF WE WERE TO MAKE THE KIND OF RESEARCH INVESTMENTS THAT WE REALLY OUGHT TO BE MAKING. WHAT REALLY DISTURBS ME ABOUT FEDERAL FUNDING FOR AGRICULTURAL RESEARCH IS THE SAD FACT THAT IT WOULD TAKE $48 MILLION FOR US TO CATCH UP TO WHERE WE WERE IN FEDERAL FUNDS FOR THE STATE AGRICULTURAL EXPERIMENT STATIONS WAY BACK IN 1966. IN OTHER WORDS, WE HAVE SLIPPED BY $48 MILLION IN TERMS OF 1966 VALUE DOLLARS. IN THE STATE AGRICULTURAL EXPERIMENT STATIONS, WE ACTUALLY HAVE FEWER SCIENTISTS WORKING ON BEEF CATTLE RESEARCH IN 1976 THAN WE HAD BACK IN 1970. WE HAVE BEEN MAKING PROGRESS WITH "ONE HAND TIED BEHIND OUR BACKS"! THE MOST RECENT FIGURES I HAVE SEEN SUGGEST THAT WE ARE DOWN ABOUT 125 SCIENTIST YEARS IN 1976 FROM WHAT WE HAD AT THE STATE AGRICULTURAL EXPERIMENT STATIONS 10 YEARS AGO.

I ADMIT THAT I AM NOT VERY ASTUTE ABOUT A GREAT MANY THINGS, BUT WHEN I SEE EVIDENCE THAT WE CAN GET AN OVERALL ANNUAL RETURN OF 28 PERCENT ON OUR INVESTMENT DOLLARS FOR RESEARCH (AND I AM TALKING ABOUT RESEARCH ON ALL LIVESTOCK AND CROPS) I CAN ONLY CONCLUDE THAT WE ARE NOT SHOWING GOOD WISDOM BY FAILING TO MAKE THAT INVESTMENT WHETHER WE DO IT AT THE NATIONAL LEVEL WITH FEDERAL FUNDS FOR OUR STATE AGRICULTURAL EXPERIMENT STATIONS OR WHETHER WE DO IT WITH STATE FUNDS FROM OUR OWN LEGISLATURES.

IT JUST SEEMS TO ME THAT THE BEST SOLUTION TO THE LONG-TERM PROBLEM OF HIGH FEED COSTS FOR RUMINANT ANIMALS IS GREATER USE OF GRASS, HAY, AND BY-PRODUCTS OR WASTE PRODUCTS OF VARIOUS KINDS. I AM CONVINCED THAT WE HAVEN'T REALLY SCRATCHED THE SURFACE ON IMPROVING THE YIELD, THE QUALITY OR THE TECHNIQUES FOR UTILIZING FORAGES IN LIVESTOCK PRODUCTION. OUR NATIONAL RESEARCH EFFORT ON FORAGE PRODUCTION HAS BEEN WOEFULLY INADEQUATE. WE NEED A LOT OF RESEARCH ON DEVELOPING HIGHER YIELDING, MORE PALATABLE, AND MORE NUTRITIOUS GRASSES AND LEGUMES. ALTHOUGH THE LARGE ROUND BALES, AND MUCH OF THE HAY HANDLING EQUIPMENT THAT IS AVAILABLE THESE DAYS HAS HELPED TREMENDOUSLY, WE STILL NEED TO IMPROVE ON OUR TECHNIQUES FOR THE HARVESTING AND STORING OF FORAGES, SO AS TO MAINTAIN THEIR PALATABILITY AND THEIR NUTRIENT VALUE. WITH THE PRESENT COST OF NITROGEN FERTILIZERS THERE'S JUST NO QUESTION BUT WHAT WE NEED TO DO A LOT OF RESEARCH ON BIOLOGICAL NITROGEN FIXATION SO THAT WE CAN REDUCE NITROGEN FERTILIZER NEEDS. THIS IS ONE OF THE APPROACHES THAT WE ARE TAKING WITH OUR FERTIBULL PASTURE RENOVATION PROGRAM. A VIGOROUS STAND OF ALFALFA WILL FIX 200 TO 250 POUNDS OF NITROGEN PER ACRE ANNUALLY. IF WE REALLY WORKED ON IMPROVING THE NITROGEN FIXING CAPABILITY OF ALFALFA WE MIGHT BE ABLE TO DOUBLE IT! I AM CONVINCED THAT WE NEED TO RE-EXAMINE MUCH OF THE ANIMAL NUTRITION WORK WHICH WAS DONE 30 AND 40 YEARS AGO. THE VARIETIES OF CROPS THAT WE ARE GROWING NOW ARE QUITE DIFFERENT THAN THEY WERE BACK THEN. FERTILITY LEVELS OF OUR LAND ARE VERY DIFFERENT--EVEN OUR LIVESTOCK HAS BEEN CHANGED THROUGH GENETICS. IN OHIO, WE HAVE RUN INTO VERY SERIOUS SELENIUM DEFICIENCIES IN RECENT YEARS AND

THE PAYOFF FROM SUPPLEMENTING BEEF, DAIRY, SWINE AND POULTRY RATIONS WITH SELENIUM HAS BEEN LITTLE SHORT OF PHENOMENAL. WHO KNOWS WHAT OTHER ELEMENTS MAY BE HOLDING DOWN THE EFFICIENCY OF OUR LIVESTOCK PRODUCTION? A GREAT DEAL OF RESEARCH IS NEEDED, AND WILL ALWAYS BE NEEDED, AS WE CHANGE THE NATURE OF OUR FARMING OPERATIONS, AND CHANGE THE GENETIC COMPOSITION OF OUR CROPS OR THE GENETIC CAPABILITIES OF OUR LIVESTOCK.

WE ALREADY HAVE A LOT OF GOOD ANSWERS, AND MANY OF OUR FARMERS ARE UTILIZING RECOMMENDED PRACTICES. THE POINT I WOULD MAKE IS THAT WE NEED TO CONTINUE WORKING TOGETHER SO THAT THE EFFICIENCY OF OUR LIVESTOCK PRODUCTION CAN CONTINUE TO BE IMPROVED IN THE FUTURE AS IT HAS BEEN IN THE PAST.

I HAVE BECOME INCREASINGLY CONVINCED THAT FANCY BUILDINGS AND EQUIPMENT OR FANCY-PRICED BREEDING STOCK WILL NOT GUARANTEE SUCCESS. ON THE OTHER HAND, DEDICATION, HARD WORK, AND A CONTINUING DESIRE TO KEEP UP WITH THE LATEST AND BEST INFORMATION WHICH IS AVAILABLE, ALONG WITH SPENDING ADEQUATE TIME WITH OUR LIVESTOCK TO OBSERVE AND UNDERSTAND WHAT IS HAPPENING OFFERS THE BEST OPPORTUNITIES FOR SUCCESS.

IN OHIO, WE ARE UTILIZING THE COMPUTER TO DETERMINE LEAST-COST RATIONS FOR BEEF CATTLE AND HOGS. WE NEED TO DEVELOP SIMILAR TYPES OF COMPUTER PROGRAMS FOR THE COW-CALF ENTERPRISE. I AM CONVINCED THAT THERE IS A GREAT DEAL TO BE GAINED FROM MORE INTENSIVE USE OF THE COMPUTER IN OUR FARM MANAGEMENT DECISIONS.

I WISH THAT I HAD SOME PAT ANSWERS TO THE QUESTIONS WHICH ALL LIVESTOCK PRODUCERS HAVE CONCERNING THE COST-PRICE CRUNCH.

BUT AS YOU FOLKS KNOW, THERE ARE NO PAT ANSWERS, YET WE DON'T HAVE TO DEPEND ENTIRELY ON LUCK, EITHER. GOOD MANAGEMENT, THE USE OF LEAST-COST RATIONS, GREATER USE OF IMPROVED FORAGES, PERFORMANCE TESTING OF BREEDING STOCK, AND KEEPING OF ACCURATE RECORDS, ALONG WITH COMPUTER ANALYSIS OF THOSE RECORDS IS REALLY ALL THAT I CAN OFFER YOU. IF THERE ARE BETTER ANSWERS, I HAVE NOT HEARD THEM. AGAIN, I WOULD LIKE TO INVITE ALL OF YOU TO VISIT THE EASTERN OHIO RESOURCE DEVELOPMENT CENTER AT CALDWELL FOR OUR FIRST PERFORMANCE TESTED BULL SALE ON APRIL 25, AND INVITE YOU TO VISIT OUR OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER AT WOOSTER OR ANY OF OUR OUTLYING RESEARCH BRANCHES WHENEVER YOU MAY HAVE OCCASION AND OPPORTUNITY TO BE IN OUR BUCKEYE STATE.

THANK YOU.

LIVESTOCK RESEARCH - WE ACCEPT THE CHALLENGE

S. P. Wilson

To justify the conduct of livestock research requires some preliminary discussion of the necessity of agricultural research. Five years ago we were dealing with surpluses in most food commodities,and public statements generally were that there was little reason to continue to support research in production efficiency. However, since that time we have evolved into a situation where public statements decry the food shortage and talk is of present and impending world food shortages. The truth of the matter is that food production now significantly exceeds any period in the past. The problem is population. The world has too many people, most of whom cannot pay for the surplus food that is available, and the United States, Canada, and Australia simply cannot afford to give the food away. The food-population problem will only intensify unless significant reductions in rate of population increase are realized in the critical countries of Asia, Africa, and South and Central America.

The most efficient of domestic animals consume more potential human food than they produce; therefore, the often heard statement, "animal agriculture should be discontinued". To do this, to utilize only plant source food for humans is no more than a stop-gap against the impending disaster and simply postpones the critical phases of the inevitable food-population problem to a future time when there are more people, thus making the problem more severe. This problem should be faced now, and we should definitely continue to produce animal source foods. Quality of life is very important and animal foods are an integral part of maintaining quality along with existence. However, we must through new biological technology improve the overall efficiency of producing animal-based foods

and particularly beef. Though beef cattle are less efficient in converting grain to edible tissue, they have a tremendous advantage in converting forages to human food.

Now that we have established that we should and will continue in the business of producing beef, likewise, the Auburn University Agricultural Experiment Station will continue in the beef cattle research business. WE DO ACCEPT THE CHALLENGE. However, those are just some more words. What are we going to do to fulfill that commitment? In the past we have been reluctant to do any type of research that might distinguish differences between existing breeds. We have usually answered questions by stating that there are good animals in all breeds. True, but there are breed differences and we must produce systems that exploit and develop the advantages of breeds and minimize the disadvantages. Also we must report to you in a straightforward manner, right to the point.

How would a feeder, Bill Brown for example, like a consistent supply of crossbred animals, tailormade for his kind of feeding operation? That can only be done with a specific cross. There are some problems, but I am not giving up on the idea. Certainly for high forage systems we need an earlier maturing, easier finishing animal than for high energy feeding. Therefore, a major part of our beef cattle research program is aimed at developing the necessary information on this issue. At this time, we are not settled on a third breed to be used with the Hereford and Angus breeds for this particular system. We hope that the research programs now going in place will yield information that will allow us to make definitive judgments about animal type and production systems for forage and high energy feeding regimes.

It is imperative that we develop much more knowledge of the basic biological functions of cattle. I particularly refer to the total endocrine system. Only through much more of this type of information can we hope to

make dramatic improvement in reproductive efficiency and feed conversion, the two traits we absolutely must improve if beef cattle are to remain in a dominant position relative to other sources of animal protein. We now can stimulate multiple ovulations and multiple implantations in cattle, but in most cases the fetuses are aborted, and where multiple births are achieved, rebreeding is a tremendous problem. However, we must continue to work in this important area with a reasonable effort until a breakthrough is achieved. With feed efficiency, an aggressive effort in basic digestive physiology is fundamental to understanding the metabolic system, and fundamental to producing dramatic improvement. However, we can, by utilizing individual selection, make consistent and significant improvement in feed efficiency. There are differences among individuals in metabolic efficiency, in fact, about 35% of the observable differences in ability to gain appear to be due to differences in individual ability of the metabolic system to convert food energy to body tissue. Therefore, in constructing the new bull testing facilities for the Agricultural Experiment Station, we intend to provide for individual feeding so that potential herdsires can be individually evaluated for feed efficiency. We simply do not believe that group testing of bulls for feed efficiency continues to be a viable approach to a modern testing program.

Recycling of animal waste through beef cattle is a proven concept and one that has been pioneered here at Auburn. We believe that the concept and practice is sound and it does save feed, thus improving feed efficiency. However, this improvement in feed efficiency does not result from an improvement in metabolic efficiency. We do face the possibility of problems from the Food and Drug Administration, and the burden of proof will be on the experiment stations to conclusively prove that toxic or pathogenic materials do not contaminate edible tissues. We are gearing up to develop the necessary data.

I reiterate, WE ACCEPT THE CHALLENGE to conduct a viable and efficient animal research program in the Auburn University Agricultural Experiment Station. We believe that we are building such a program. However, words are worthless. We challenge you to develop a strong and perceptive interest and knowledge of all agricultural programs in Alabama that are supported by public money, your money. Judge us, debate with us, challenge us and demand programs that do the job.

How Clint Hardin Puts More Weight On Light Calves

Getting 500 pounds of beef per acre by cashing in on the mistakes of others. Putting it simply, that's what Clint Hardin of Moulton, Alabama does.

Each fall, Hardin buys 800 to 1,000 beef calves weighing about 375 pounds each and sells them the following June weighing around 700 pounds. Most of the gains are put on with grazing.

"I'm getting about 500 pounds of beef per acre," Hardin said. "And I figure it costs me about 20 cents a pound to produce it."

Material for this article was taken from Hardin's remarks made at the Beef Conference held at Auburn University, as written by Kenneth Copeland Auburn University Cooperative Extension Service.

After starting this practice in 1962, it wasn't long until Hardin quit row crops, then chickens and finally hogs, leaving beef as his sole farming business.

Really what Hardin does is make a profit from cattlemen who make the mistake of weaning and selling lightweight calves--a money losing error. Getting cattlemen to stop weaning and selling lightweight calves is one of the Alabama Cooperative Extension Service's No. 1 goals for beef production

in its Impact '80 goals. The Extension Service is aiming to increase weaning weights of calves in Alabama from 380 pounds in 1975 to 460 by 1980 and selling weights from less than 400 pounds to 650- to 700-pounds.

Let's look closer at Hardin's program. During August he fallows his land for planting of winter grazing. About the first of September he plants either ryegrass and wheat or rye. He starts grazing these crops in late October or the first of November. Depending on weather conditions, he grazes these crops on into December, sometimes up until December 31. Then he pulls animals off grazing and puts them on a winter feeding program, which includes silage, roll hay and cotton-seed, for 60 to 70 days.

Hardin has found some tricks which work well for him. Buying only calves with a good bone structure is one of the basics. He usually buys four types of cattle--Herefords, Angus, white bald faces and Charolais crosses. "We buy and group in these lots," he explained. "Then we can sell them accordingly and attract buyers who want a particular groups of animals."

Calves get special attention as soon as they hit his farm after being bought in the fall. He thinks that this extra care is one of the secrets of his success.

Calves are processed as soon as they arrive. This involves worming, giving shots for IBR, CB, blackleg, lepto and an antibiotic. Then each animal is ear tagged and weighed and this information recorded. Hardin also notes where he bought calf, when, what he paid for it, etc.

Calves are put in a small pasture where Hardin can watch them closely. Then in three weeks calves are weighed again. Those that are gaining well go to a bigger pasture. Any calf that hasn't gained is kept in the small pasture where it's treated for any illness. If sick calves haven't gotten well and started gaining in another two to three weeks, they're sold.

Next, calves are put on grazing, then winter feeding followed by additional grazing in the spring before going to market in June.

Since 1962, Harding has lost money only one year, broke even two years and made money the other years.

HEALTH PROCEDURES OF STOCKER CALVES

J. Lee Alley, D.V.M.

Disease control and prevention is a major concern for all stocker grazing programs. Respiratory diseases are the most important disease problems facing a stocker program. Death loss may not be the major problem since treatment, labor, medications, and retarded growth and developments may be even more costly.

There is no one program that will eliminate disease and death losses in a stockering operation, but there are effective procedures that will certainly reduce the total economic losses due to disease. I will attempt to outline our procedures for handling stocker calves that we put together for grazing each year.

Most of our calves are purchased by an order buyer from local stockyards. We instruct our buyer to purchase healthy farm fresh calves. Procurement of healthy calves is essential if disease loss is to be held in check.

Calves are delivered to us in clean trucks as soon after purchase as possible. Calves are unloaded and processed as soon as possible. Usually this processing is the next morning.

Processing consists of vaccination for blackleg, malignant edema, infectious bovine rhinotrachitis, para-influenze 3, and leptospirosis. All male calves are castrated and those calves with horns are dehorned. Each animal is wormed with tramisol oblets and treated with Warbex.

Each animal receives a dose of terramycim and sulfamethazine. The cattle that we purchase weigh approximately 400 pounds and each animal receives 30 to 40 cc of terramycin and one spanbolet per 200 pounds of body weight.

After processing, calves are held in isolation pens for two to three weeks. During the isolation period, calves are offered free choice long hay, medicated feed, and fresh drinking water. Getting newly purchased calves to eat and drink is very important if you are to have an effective disease control and prevention program.

The medicated feed contains aureomycin. The level of aureomycin is at a rate high enough to assure that each animal consumes 5 milligrams per pound of body weight daily. This drug level is much higher than the normal recommended levels.

During the isolation period, we try to observe the calves very closely for signs of illness at least three times a day during the first fourteen to twenty-one days. Those calves showing signs of sickness are removed and treated as soon as possible. Respiratory diseases are the primary disease sign that are encountered.

Our normal treatment program of calves showing signs of respiratory disease consists of the following:

(1) 10 cc of terramycin per pound of body weight given intraveneously
(2) 125 cc of triple sulfur per pound of body weight given intraveneously
(3) 500 cc of 50 percent dextrose given intraveneously
(4) One spanbolet per 150 pounds of body weight

Calves receiving this treatment do not receive any additional medication unless no response is observed to the above treatment in four or five days. If no response is observed, calves will be retreated with different drugs.

Calves that die are submitted to the diagnostic laboratory for post-mortem examination. Bacterialogical culturing is conducted for isolation of the causitive agent and antibiotic sensitivity testing.

Each animal is implanted with Ralgro as they are turned on cool season grazing. If cattle are re-handled for any reason during the grazing period and it has been over sixty days since they were implanted, we will reimplant them.

Each calf is retreated with tramisol oblets for internal parasitic control as they are turned on grazing. If they were not treated with Warbex during initial processing, they receive a treatment as they are placed on the grazing.

COOL-SEASON GRAZING DEMONSTRATION

Mike Davis

Alabama is predominately a cow-calf production state. We produce weaned calves and maintain brood herds. Calves are usually born in the winter months and grazed on permanent pasture through the summer and weaned in the fall when calf prices have historically been at their lowest. In addition to this, our average weaning weight is about 330 pounds. With costs of production increasing greatly during the last four to five years, it has become increasingly difficult to make a profit by selling weaned calves in the fall.

One alternative open to wiregrass area farmers is to carry these weaned calves through the winter on winter grazing planted on prepared land. This demonstration represents that alternative. Following peanuts, 60 acres were doubled disced and a combination of Rye, Ryegrass and Yuchi clover was planted on September 29th. The land had been soil tested and fertilized broadcast accordingly. The soil pH was 6.7 and only nitrogen and potassium were recommended. Murate of potash was applied at the rate of 156 pounds per acre, resulting in 94 units of potassium. The nitrogen was applied in split applications. Prior to planting, 237 pounds of urea was applied per acre. A second application of 170 pounds per acre was applied in mid-February.

Weser rye was drilled at the rate of 2.4 bushels per acre. Gulfcoast ryegrass and Yuchi Arrowleaf clover were boradcast at the rate of 15 pounds and 6.7 pounds per acre, respectively.

Seventy-six calves of mixed breeding were purchased at local stockyards at an average price of .265 cents per pound and an average weight of 431 pounds. An attempt was made to select calves grading either choice or high good.

The calves were pooled and worked the week of November 9th. The calves were vaccinated for IBR, BVD, Leptospirosis, blackleg, and malignant edema. All calves were implanted with Ralgro, wormed with Tramisol, and treated for grubs and lice with Warbex.

We would like to thank the companies and individuals responsible for donating all pharmaceuticals. Syntex Corporation, Des Moines, Iowa; American Cyanamid, Princeton, New Jersey; and Commercial Solvents Corporation, Terre Haute, Indiana. Mr. Bill Gregory, District Sales Manager, located in Montgomery for American Cyanamid arranged for the donation of the Warbex and Tramisol from American Cyanamid. Mr. Horace H. Horn, Jr., Hannah Supply Company, P. O. Box 9422, Montgomery, arranged through Syntex Corporation and Commercial Solvents Company for the implants and vaccines.

Seventy-five steers were placed on the grazing November 18*. They averaged 427 pounds. Two steers required treatment for pink eye. The steers remained on the grazing until January 21 when extreme cold and lack of grazing forced removal of the steers for 9 days during which time hay was fed. This hay represented the only additional feed provided for the steers. Steers were replaced on the grazing on January 30th and have remained on pasture to present. Trace mineralized salt was provided free choice.

* One steer died prior to being placed on grazing.

On Monday, May 3rd, the steers were weighed. They averaged 775 pounds per head. Total gains for the 167 day period were 348 pounds per head. Average daily gain for this period was 2.08 pounds per head.

Total pasture costs were $4904.11. Total gain for this period was 348.46 pounds per head, resulting in a cost per pound of gain of 18.8 cents per pound.

For the complete stocker operation, costs totaled $15,011.13. The cattle were sold to order buyers on a bid basis and exact prices are not available. However, the prevailing market price was used to arrive at an estimated return figure. The current market price of 40 cents per pound was arrived at. With this price, returns were $310.19 per head, or a total return of $23,264.10. This resulted in a net return of $8,252.97 or $110.03 per head.

Attached is an itemized sheet of costs and returns.

Calves were taken off pasture on May 28, 1975. The 60 acres of clover was allowed to seed out. In mid-July the Yuchi clover was combined. Following cleaning, scarification and bagging 6,000 pounds of Yuchi Arrowleaf clover seed were sold for $1.75 per pound. Costs for desiccation, combining, cleaning, bagging, scarification, and hauling were .58 cents per pound. Total costs for the seed operation were $3,480.00. Total returns from the seed operation were $10,500.00 for a net return of $7,020.00. Combined income from both the steers and clover seed was $15,272,97.

COSTS AND RETURNS

RETURNS:

75 steers @ 775.47# @ 40¢/lb.	$ 23,264.10

COSTS:

76 calves @ 430.8# @ 26.5¢/lb.	$ 8,676.32
Grazing Seed	2,472.40
Fertilizer	1,793.72
Supplemental Feed	
Hay 3.65 tons @ $40/ton	146.00
Minerals and Salt 1500# @ .05¢/lb.	75.00
Hauling and Marketing $8/head	600.00
Veterinary Costs	38.00
Tractor and Equipment Operation @ $6/Acre	360.00
Interest on Operating Capital $14,161.44 @ 8% 9 Mo.	849.69
TOTAL COSTS	$15,011.13

RETURNS ABOVE COSTS

Total Returns	$23,264.10
Total Costs	15,011.13
Net return to land, labor, and management	$8,252.97
Net return per head	$110.03
Net return per acre	137.54
Percent return on investment	54.9%
Return per head due to increase in price	58.16
Return per head due to increase in weight	51.87
Gain per steer	348.46#
Steer Gain per Acre	435.58#
Average Daily Gain	2.08#

PASTURE COSTS FOR 60 ACRES RYE-RYEGRASS-YUCHI CLOVER

GRAZING:	
Seed	
Rye (Weser) 144 bushels @ $9.50 per bushel (2.4 bu./Ac.)	$1368.00
Ryegrass (Gulfcoast) 922# @ 20¢/lb. (15#/Ac.)	184.40
Yuchi Clover (Arrowleaf) 400# @ $2.25/lb. (6.7#/Ac.)	900.00
Inoculation 24 pkgs. @ 85¢/pkg. (3 pks/50#)	20.40
FERTILIZER:	
Potassium - 9,375 lbs. @ $95/ton (156#/Ac.) (Total potassium 94 units)	445.31
Urea (9-20-75) 14,250 lbs. @ $110.30/ton (237.5#/Ac.)	785.88
Urea (2-15-76) 10,200 lbs. @ $110.30/ton (170#/Ac.) (Total Nitrogen 183 Units)	562.53
Equipment Operation Costs @ $6.00/Ac.	360.00
Interest on Pasture Costs:	
$4,626.52 @ 8% for 9 months	277.59
Total Pasture Costs	4904.11
Cost per acre	81.74
Cost per steer	65.39
Cost per Pound Gain	18.8¢/lb.

COSTS AND RETURNS FROM CLOVER SEED HARVEST

Returns:

6,000# Yuchi Arrowleaf Clover @ $1.75/#	$ 10,500.00

Costs:

Combining 60 acres @ $25/acre	1,500.00
Dessicant application @ $8/acre - 60 acres	480.00
Hauling, cleaning, scarification, and bagging 6,000# @ 25¢/#	1,500.00
TOTAL COSTS	$ 3,480.00

Returns Above Costs:

TOTAL RETURNS	$10,500.00
TOTAL COSTS	3,480.00
NET RETURNS FROM CLOVER	$7,020.00

Total Net Return from 60 Acres:

NET RETURN CATTLE	8,252.97
NET RETURN CLOVER	7,020.00
TOTAL NET RETURN	$ 15,272.97

GROWTH STIMULANTS AND FEED ADDITIVES FOR BEEF CATTLE

By B. G. Ruffin

Growth stimulants and feed additives have played major roles in improving the growth rate and feed efficiency of beef cattle for more than 20 years. Research shows that some materials on the market are effective and economical while others are inconsistent in effect and uneconomical. Cattle receiving growth stimulants or recommended feed additives require 5 to 10 percent less feed to produce the same amount of meat as those without stimulants or additives. Also, recommended implants have been shown to improve growth rate in cattle from 10 to 18 percent. By using both an implant and a feed additive, it is possible to show a feed savings of about 10 to 20 percent.

As a result of this increased performance, several hormones or hormone-like products are now being used in more and more cattle. In general, improved rate of gain and the decrease in feed required per pound of gain will return many times the cost of recommended growth stimulants and feed additives.

Stimulants not only produce a beneficial response in finishing cattle but also in stocker and nursing calves. However, growth stimulants are approved for growing cattle destined for slaughter, and not for cattle that will be retained for breeding purposes.

IMPORTANCE OF GOOD NUTRITION

The greater response to growth stimulants observed in finishing cattle has been in those fed high energy rations and the response in stockers is closely related to energy intake and pasture conditions. In fact, the mothering ability of the dam and her nutrient intake will govern response to stimulants in the suckling calf. Thus, for maximum response from growth stimulants and feed additives, cattle should be on a high level of nutrition and gaining rapidly.

PROPER USE OF STIMULANTS AND ADDITIVES

Implanting is not a difficult procedure, but it can cause adverse side effects, poor feed efficiency and reduced growth rate if done improperly. The same is true for feed additives if errors are made in mixing and feeding. It is very important to follow instructions regarding where to place the pellets as well as how to properly mix and feed additives.

The correct implant site is on the back side of the ear. At slaughter, the ears are removed with the hide, thus insuring that no implant residue, if present, will remain in the edible portion of the carcass. Insert the implanting needle about 1½ to 2 inches from the base of the ear. Direct the needle toward the head and deposit pellets under the skin within ½ to 1 inch of the ear base. Be careful not to crush the implant either on injection or when removing the implant needle.

Maintain sanitary conditions and a sharp needle at all times. Always restrain the animal in a chute with a head catch and working facilities to prevent errors in implanting growth stimulants.

EFFECT ON CARCASS

Some stimulants have been known to reduce carcass grade, but this reduction is insignificant in most cases if implanting is done properly and soon enough before slaughter. Data also indicate that these materials increase the percentage of protein and moisture while decreasing fat in the carcass. Recommended stimulants or feed additives, therefore, do not adversely affect carcass grade, shrink or yield. And there is no danger from eating the meat of implanted cattle when proper procedures have been followed.

USE RESTRICTIONS

There are a number of materials currently approved by the Food and Drug Administration (FDA) that are being used by beef cattle producers.

Growth stimulants and additives are worthy management tools, but care must be taken to insure proper use. Because of frequent changes in FDA regulations governing the use of implants and feed additives, always read instructions at the time of purchase.

The following table lists materials with comments and restrictions. These have been shown by research to give fairly consistent results. More information is needed before the use of other materials can be justified.

USE RESTRICTIONS OF GROWTH STIMULANTS AND FEED ADDITIVES

Trade Name	Contains	Levels	Method of Use	Withdrawal before Slaughter	Re-implant Interval	Type Animal Approved	Comments
DES	Diethyl-stilbes-trol	12 mg. for calves; 36 mg. for heavier cattle	Ear implant	120 days	120 days	Suckling calves, steers and heifers	Available as implants. May cause high tail head, side effects and prolapse. Costs less.
Ralgro	Zearalanol	36 mg.	Ear implant	65 days	120 days	Suckling calves, steers and heifers	Available as implants. Fewer side effects such as riding, high tail head, etc.
Synovex-S	200 mg. progester-one and 20 mg. estra-diol	220 mg.	Ear implant	60 days	120 days	Steers over 400 pounds	Available as implant. May produce bullers, prolapse and other side effects.
Synovex-H	200 mg. testoster-one and 20 mg. estradiol	220 mg.	Ear implant	60 days	120 days	Heifers over 400 pounds	Available as implant. May produce bullers, prolapse and other side effects.
MGA	Meleng-estrol acetate	0.25 mg. to 0.5 mg. per head per day	In feed	48 hours	Not appli-cable	Mature heifers	Available as supplements and in complete feed. Depresses heat in mature heifers and withdrawal longer than 72 hours heifers will return to heat. Is the only growth pro-motant approved by FDA that can be fed.
Rumensin	Monensin	30 mg. per ton	In feed	No with-drawal	Not appli-cable	Growing finishing steers and heifers	Available as supplements and in complete feeds and pre-mixes. Improves rumen fer-mentation resulting in im-proved feed efficiency by approximately 10 percent. Re-duces feed intake while main-taining gain. Do not feed to horses or other equine, may be fatal

WINTER ANNUAL GRAZING CROPS

Donald M. Ball
Agronomist - Pasture and Forages
Alabama Cooperative Extension Service

Alabama cattlemen have a tremendous advantage over producers in most other parts of the country! The advantage to which I'm referring is our ability to grow winter annual forage crops during some of the coldest months of the year. I can assure you that is an advantage which cattlemen in other areas would like to have also.

When we talk about winter annual forage species in Alabama, we're primarily talking about some combination of three types of plants: (1) small grain - usually either rye or wheat, although sometimes oats; (2) annual ryegrass; and (3) annual clover - usually either crimson or arrowleaf clovers. Use of these winter annuals to provide winter grazing for stocker calves has been a profitable enterprise for the Alabama cattlemen in recent years, and with grain prices remaining high, it appears that it will continue to be so. We currently have an estimated 600,000 acres of winter annual forage crops in Alabama, and the acreages is increasing each year.

Although some of you in attendance here today have been growing winter annuals for years, I imagine there are also some producers here who haven't utilized them to any great extent. I, therefore, thought it might be well for me to discuss some of the questions which I am frequently asked by producers who are entering into a winter annual grazing program for the first time.

One such question is: "Why plant mixtures? Aren't all of these winter annual forages high in quality?" It's true that any of these winter annuals will provide highly palatable, highly digestible forage -- the advantage of planting mixtures is that by so doing, we extend the grazing season. Small grain will make more growth in the fall and winter than other winter annuals, ryegrass makes most of it's growth in early spring, while annual clovers (particularly arrowleaf clover) make more growth in the late spring. Therefore, when we plant mixtures of small grain, ryegrass and annual clover, we can provide high-quality grazing over a long period of time.

Another question a producer might have is" "Is it really worthwhile to include clovers in winter annual pastures?" I believe that it's almost always worthwhile to include clovers because of their nitrogen-fixing capabilities and their tendency to extend the grazing season (as mentioned before). I think that the only time it would not be worthwhile to include a legume in a winter annual pasture would be whe a producer plans to terminate grazing very early in the spring before he would have a chance to obtain much benefit from the forage and nitrogen the legume would produce.

Another question I'm frequently asked is: "Which is better -- arrowleaf clover or crimson clover?" I think that the best answer to that question is that it depends on how an individual producer plans to handle his winter grazing operation. Crimson clover generally makes more fall growth than arrowleaf, and will provide the greatest amount of grazing in March and early April. Since it makes its' growth early, it's a good choice for a producer who wants to turn his winter grazing land early so he can plant a summer row crop. Arrowleaf clover, on the other hand, makes most of its' growth in April and May and is therefore,

a better choice for producers who want to extend their grazing period over the longest possible time period. As far as forage yield and quality, these two winter annual legumes are essentially equal.

There are several points which need to be kept in mind during the establishment of cool season annual grazing crops. Of course, as with any crop, the lime and fertility needs of the crop need to be satisfied. Taking a soil test and following the recommendations is essential for optimum production.

It's also important to plant on time. When planting on a prepared seedbed, we recommend August 25-September 10 for North Alabama; September 1-15 for Central Alabama; and September 15-30 for South Alabama. If ryegrass and/or annual clover is to be overseeded on dormant warm-season pastures a producer should delay planting 4-6 weeks later than this in order that the summer forage species will not compete with the young seedlings. Planting on time is important from two standpoints. First, early planted winter annuals will allow earlier grazing. Second, this gives the seedlings the opportunity to become established and develop a good root system prior to cold weather which might damage or kill very young plants.

It's also important, of course, to be sure you use the correct seeding rates and plant at the right depths. Auburn University's recommendations for planting winter annuals are given in Alabama Cooperative Extension Service circular A-36, "Winter Grazing for Stocker Calves." After planting winter annuals, it is highly desirable to firm the soil with a roller or cultipacker.

One final point I'd like to mention is management of winter annual pastures after they have been established. The young plants should not be grazed until they have become well-established. We generally recommend that these pastures not be grazed until they are about six inches tall. With the possible exception of South Alabama, there will be period during the winter, during which cool-season grazing crops will not be making enough growth to support grazing animals. During these periods, the animals will need to be provided with supplemental feed. It's also a good idea to keep animals off of a winter grazing pasture during extremely wet, muddy periods -- especially in the fall and early winter while the plants are small.

One final point I'd like to mention is that a producer should take care not to let the forage growth "get ahead of the cattle." This is most likely to occur during the spring flush of growth. Cattle trample and waste forage if there is excess growth present in the field. The producers who have the most successful winter grazing programs adjust their stocking rate to keep the pasture grazed down fairly close.

Alabama is a state with tremendous forage production potential. Winter annual grazing crops are an important part of the Alabama forage picture and I believe they will be increasingly important in the future.

MANAGED OR CONTROLLED GRAZING ON COOL-SEASON PASTURES

R. R. Harris, C. S. Hoveland, J. K. Boseck and W. B. Webster

Cereal grain-clover pastures provide the basis for an excellent method of growing stocker beef calves in Alabama. However, good management usually requires removal of calves from the cool-season pastures for up to 60 days during winter, especially in northern Alabama.

During 1971-75 an experiment was conducted at the Tennessee Valley Substation, Belle Mina, to determine whether daily hay feeding would reduce the time cattle were off pasture during the winter or improve animal gain. Coastal bermudagrass hay was fed either on the cool-season test pasture or on an adjacent sod area.

Test Procedure

Six 2-acre paddocks of wheat-ryegrass-arrowleaf clover were established annually. Pastures were grazed whenever forage supply and weather conditions permitted during the October-June period.

Yearling beef steers averaging about 475 lb. each were divided into three groups to compare three management systems on grazing. Two pastures were grazed in each of the management systems.

Group 1 - Steers had continuous access to test swards and were fed a daily allowance of hay (3.3 lb. per steer).

Group 2 - Steers were grazed 5 to 6 hours daily and then removed to an adjacent summer grass sod where they were fed hay (2.8 lb. per day) and kept overnight.

Group 3 - Steers grazed when forage was available, but without hay being fed, and were removed to barn when forage was insufficient during January and February.

Because of weather conditions, steers in groups 1 and 2 also had to be removed from test pastures during mid-winter. All were fed in the barn during the time off grazing. Groups 1 and 2 got hay and cottonseed meal as their wintering ration, while group 3 steers were fed corn silage supplemented with rolled corn and cottonseed meal.

As an average, grazing began October 17 and lasted until June 2. Wheat and ryegrass provided most of the forage since clover stands were generally only fair to poor.

Pastures were stocked with 2 to 3 steers per acre, but weather conditions prevented maintaining this rate. The most accurate measure of pasture carrying capacity was animal grazing days per acre, and this measure was used in evaluating systems.

Hay Boosted Carrying Capacity

Feeding hay increased the carrying capacity of the test pastues, as shown by data in the table. However, the extra gain per acre because of the higher stocking rate was less than expected. Carrying capacity was increased 29-62% by hay feeding, but per acre gain was increased only 10-15%.

Rate of gain per steer was considerably less on these pastures than usually obtained under similar conditions. Typical gains in the past have been about 1.6 lb. daily, whereas these amounted to 1.0 and 1.4 lb.

Hay feeding also reduced the number of days that steers had to spend off the pastures. However, as indicated earlier, this did not result in the predicted animal gain per acre of land. In the case of limited grazing (Group 2), extra labor was necessary for managing the cattle.

Hay consumption totaled about 1,000 lb. per steer for the winter period. This includes that fed as a wintering ration plus that fed on pasture.

Steer Performance Disappointing

Individual steer performance was disappointing in this test. Although feeding limited amounts of hay to steers on the wheat-ryegrass-arrowleaf clover pasture increased carrying capacity up to 60%, it boosted per acre gain only 10-15% . Thus, poor steer performance must be weighed against increased carrying capacity in determining value of the practice. In the case of limited grazing, extra labor for management also must be taken into account.

ANIMAL PERFORMANCE ON WHEAT-RYEGRASS-CLOVER PASTURE UNDER MANAGED GRAZING AND WITH HAY FEEDING

Performance measure	Performance by groups		
	Group 1 continuous grazing, hay on pasture	Group 2 grazing 6 hr. daily, hay on adjacent grass sod	Group 3 no feed on pasture, off grazing in winter
Steers/treatment, No.	44	46	24
Grazing days/acre	411	517	319
Grazing gain/acre, lb.	467[1]	485[1]	423
ADG on grazing, lb.	1.13[1]	.94[1]	1.44
Days grazed	183	189	170
Days off grazing	45	39	58
Total feed/steer:			
Coastal hay, lb.[2]	1,090	944	-
Cottonseed meal, lb.[3]	67	58	99
High moisture corn, lb.[4]	-	-	132
Corn silage, lb.[5]	-	-	2,218

[1]Includes gain made from hay fed during grazing period.
[2]Fed at rate of 13 lb. per steer daily when off grazing.
[3]Fed at rate of 1.5 lb.per steer daily when off grazing.
[4]Fed at rate of 2 lb. per steer daily with silage as wintering ration.
[5]Full-fed, 34 lb. per day, during winter period.

Feeding on Grazing

L. A. Smith, Superintendent
Black Belt Substation

The question of feeding grain on pasture has been around for a long time. Hopefully this practice can be used to extend pasture by increasing stocking rate, improve average daily gains, improve finish on cattle, and eliminate or minimize feedlot finishing period. For this practice to be meaningful the economics must be favorable, and in many instances this has not been the case.

First I would like to review some previous work at the Black Belt Substation. In a 3 year experiment ending in 1967, three groups of steers grazed dallisgrass and white clover pastures for an average of 204 days. Group 1 received only grazing; group 2 was fed shelled corn at 1% body weight for entire grazing season; group 3 began receiving grain in July each year. Average daily gains were 1.26, 1.80, and 1.52 for groups 1, 2, and 3. At the end of the grazing season in September, slaughter grades of steers in group 1 were standard; group 2-good; and group 3-low good. After grazing steers were put in feedlot until a majority were in the choice grade. The pasture and grain costs per hundred pound of gain for growing and finishing the steers were $18.82, $20.05, and $18.89 for groups 1, 2, and 3 respectively.

In a more recent 4 year experiment at the Black Belt Substation ending in 1974, steers were grazed on three pasture combinations. Group 1 grazed dallisgrass and regal clover; group 2-½ pasture in fescue and regal clover and ½ pasture in dallisgrass and regal clover; group 3 grazed a mixture of fescue, dallisgrass, and regal clover. Steers were put on pasture November 15 each year and grazed until late September.. Groups 1, 2, and 3 were stocked at one steer per acre. They were fed hay and protein supplement as needed in the winter. At the end of the grazing season, ½ of these steers were finished in the feedlot for 114 days.

Three other groups of steers grazed comparable pastures as group 1, 2, and 3, but were fed free choice shelled corn on pasture the entire grazing season. Stocking rate was 1½ steers per acre.

Average daily gain for group receiving grazing only was 1.03 pounds for dallisgrass and clover; 1.22 pounds for ½ fescue-clover and ½ dallisgrass-clover, and 1.25 pounds for fescue, dallisgrass, clover mixtures. Cost per 100 pound of gain for these groups was $17.40, $13.56, and $13.48 for groups 1, 2, and 3. For steers receiving corn on pasture, gains were 1.99 pounds for those on dallisgrass-clover; 2.09 pounds for ½ fescue-clover-½ dallisgrass-clover; and 2.04 pounds for mixtures. Cost per 100 pounds of gain for groups 3, 4, and 5 receiving grain on pasture was $32.77, $31.89, and $32.80.

One-half of steers in groups 1, 2, and 3 were put in feedlot at the end of the grazing season and fed as one group. The cost of pasture and feed per 100 pounds of gain for these steers was $27.25. The average cost per 100 pound of gain for all groups fed grain on pasture was $32.32. Carcass grades averaged low choice from both groups of steers.

In this test, pasture was better utilized and cost per pound of gain was less for steers receiving only grazing followed by a feedlot finishing period than for those that were fed on pasture. The steers receiving corn on pasture were full fed. At the initiation of this experiment it was felt that during periods of excellent quality pastures, intake of grain would be reduced. This did not happen with steers on these pastures. A new test is underway with steers on fescue, dallisgrass-clover pastures and grain is being limited in period of highest pasture quality.

NEW GRAZING CROPS

Carl S. Hoveland, Professor
Agricultural Experiment Station and School of Agriculture
Auburn University, Auburn, Alabama

Improved forage plants are badly needed for Alabama's expanding beef cattle industry. Currently used grasses and legumes have a number of problems such as poor persistence, nematode and disease susceptibility, low forage quality, and inadequate winter production. Although forage plant breeding has been poorly supported in the Southeast, considerable progress is being made in developing better varieties for our climate and soil conditions. Forage breeding programs at Auburn involve a number of researchers on a full or part-time basis: E. D. Donnelly, C. B. Elkins, R. L. Haaland, C. S. Hoveland, W. C. Johnson, W. B. Anthony, R. Rodriguez-Kabana, and E. M. Clark.

Bermudagrass:

Several new bermudagrass varieties and experimental hybrids are being tested at seven locations in Alabama. These yield trials were established in April 1976 at Belle Mina, Crossville, Camp Hill, Tallassee, Camden, Headland, and Fairhope. Average forage yields during the establishment year for the seven locations are as follows:

Variety	Origin	Tons/acre dry forage
Callie	Mississippi	4.7
Tifton 68	Tifton, Georgia	4.2
Alicia	Texas	3.5
Coastal	Tifton, Georgia	3.4
Tifton 44	Tifton, Georgia	3.1

Results in another trial established the spring of 1975 at Tallassee in central Alabama are shown below:

Variety	Dry forage, tons/acre, 1975	Stand %, April 1976	Dry forage, tons/acre, 1976	
			First harvest	Total
Alicia	1.3	88	2.5	7.7
Coastal	1.2	75	1.7	6.3
Callie	3.8	16	0.9	5.8

Callie established quickly as the stolons grew much faster than Coastal or Alicia. However, winter damage was severe on Callie, resulting in poor stands the following year. Although establishment year yields of Coastal and Alicia were less than Callie, second year production of Callie was less because of winter damage. It is doubtful if Callie will maintain dependable stands in northern Alabama. Callie and Tifton 68 (not yet released) should be satisfactory in southern Alabama.

Digestibility of the grass is a good measure of forage quality. Results in 1976 at Tallassee are as follows:

Variety	% in-vitro dry matter digestibility of forage					
	June 15	July 16	Aug 17	Sept 9	Oct 15	Average
Coastal	65	58	56	56	40	55
Callie	60	53	54	61	45	55
Alicia	58	52	50	57	41	50

Coastal was better than Callie early in the season but the reverse was true late in the season. However, both varieties averaged the same for the year while Alicia was lower. The lower digestibility of Alicia makes this a questionable choice as compared to Coastal.

Tall Fescue

In the tall fescue breeding program at Auburn, the objectives are more winter production, grass tetany resistance (improved magnesium content of the forage), and nematode resistance. A new experimental synthetic variety developed at Auburn has been more winter-productive than Ky 31 tall fescue:

Entry	Tons per acre dry forage			
	November	March	April	June
Auburn Synthetic-2	1.1	0.9	1.2	1.2
Ky 31	0.8	0.4	1.0	1.1

The Auburn Synthetic-2, in addition to more fall, winter and spring production, has been cold tolerant and has a more open sod which should allow white clover to grow better in association with it. If further tests continue to look promising, it should be possible to release an improved tall fescue variety for our region.

Grass tetany can be a problem with cattle grazing tall fescue on wet soils in late winter and spring. We have found that on wet soils, low soil oxygen reduces the magnesium content (below 0.2% magnesium) of tall fescue forage. In contrast, tall fescue forage from well-drained sites in the same pasture will have adequate magnesium (0.3%). Screening of individual plants under low soil oxygen in the greenhouse has shown that certain plants have adequate levels of magnesium that should overcome the tetany problem. This indicates that we should be able to develop a tetany-resistant tall fescue variety.

Soil nematodes prune the root systems, reducing autumn forage production and increasing drought susceptibility. Selection for nematode tolerance is promising and should result in improved varieties with greater forage production and persistence, particularly on sandy soils.

Phalaris

This perennial cool season grass has excellent winter production and appears promising. However, nematode susceptibility is a serious problem. Selection for nematode tolerance is in progress at Auburn. Steer gains on phalaris have been good and if nematode tolerance can be incorporated into an improved variety, this grass could have a bright future in Alabama.

Ladino Clover

Regal ladino clover, developed at Auburn, is currently available in the seed trade. Renovation of tall fescue with Regal ladino clover using paraquat offers an excellent opportunity to improve pasture quality and production at relatively low cost. Current breeding work on this clover is aimed at improving disease and nematode resistance.

Birdsfoot Trefoil

An experimental birdsfoot trefoil from southern Brazil has been very promising in northern Alabama. This high quality perennial legume has had forage yields comparable to the best alfalfa varieties, good seedling vigor, natural reseeding in old stands, and normally has no bloat problem. Dry forage yields were 3.2 tons/acre in the establishment year and 5.1 tons the second year. Selection for improved disease tolerance in central Alabama has resulted in a new experimental variety currently in tests at several locations.

Reseeding Vetch

Results of a long-term breeding program have resulted in a dependable reseeding variety which is more palatable and has earlier forage production than hairy vetch. Limited seed of this as yet unnamed variety will be available the fall of 1977.

Sericea Lespedeza

Seed of Serala, a fine-stemmed sericea variety, is becoming available in greater quantity. This perennial legume is a highly productive hay crop that, in contrast to Coastal bermudagrass, does not require nitrogen fertilizer. Current breeding work has resulted in nematode-resistant experimental varieties with low tannin content of forage. These improved sericea experimentals are currently being tested.

Winter Annual Clovers

Although Yuchi arrowleaf and Autauga crimson clovers are excellent high quality legumes, a large number of winter annual clover introductions from the Mediterranean area, Australia, and other areas of the world are screened each year. Trifolium purpureum, a large clover from Turkey with blue-green leaves and long purple heads, has looked promising on prairie land of the Black Belt where arrowleaf and crimson clover do not thrive. Other promising introductions currently being tested at various locations in Alabama are Trifolium mutabile, a dense leafy late season clover from Australia; Trifolium pallidum from Greece; and Medicago tornata from Morocco. Selection work for disease resistance in arrowleaf clover is also in progress to make this good clover even better.

Conclusions

The beef cattle industry of Alabama is in need of improved grasses and legumes. Current breeding programs have made progress and can be expected to make much more in the future. The pace of this progress may seem slow, particularly with perennial forage crops. It is a task of taking plants from all

over the world and selecting and breeding varieties adapted to our specific climate and soil conditions. In the meantime, Alabama cattlemen can do much to improve their forage programs by pasture renovation and better management of currently available grasses and legumes.

POULTRY WASTES AS FEED FOR BEEF CATTLE

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Animal wastes may be valuable resources if properly managed. About 1.6 billion tons are produced per year in the United States. A large part of the wastes is from animals managed under intensive systems, frequently in close proximity to municipalities, lakes and streams. Unless these wastes are judiciously handled they may be a source of contamination to water supplies and a risk to human health and comfort. However, the wastes contain nutrients which may be used by plants and animals. Animal wastes have been used mainly as fertilizer but economic studies indicate that, at least under certain economic conditions, the plant nutrient value of the wastes is not high enough to justify cost of hauling and spreading. Furthermore, land disposal or use as fertilizer may be difficult for large concentrated animal production systems. About 50 million tons of poultry wastes are produced annually in this country. Essentially all of it is collectable since poultry are generally kept in confinement.

Waste from different species of animals appears to have nutritional value for certain phases of animal production. Poultry wastes appear to be more nutritious for ruminants than the other wastes. Feeding of poultry wastes appear to be a more economically feasible approach than disposal or using as fertilizer. It appears that use could be made of these wastes in beef cattle operations. The wastes may be used as supplementary sources of protein and minerals for fattening and range cattle and may be used in large amounts for animals in low production such as dry beef cows and stockers.

Nutritional Value of Poultry Wastes

Two main kinds of waste are collected from poultry operations, broiler litter and caged layer waste. Some turkey litter is also produced. The litter consists of a base bedding material, excreta, wasted feed and feathers. One or more crops of broilers may have been reared on the litter. The caged layer waste consists mainly of excreta collected under the cages, some wasted feed and feathers. These wastes are usually high in nitrogen (crude protein) content, averaging 28% crude protein or higher. The wastes vary considerably in protein content. The variation precludes the use of standard values for poultry wastes, but lots of waste could be analyzed, as is commonly done for forages.

The average nutritional value of poultry wastes is shown in table 1. Protein nitrogen makes up about 40% of the total nitrogen in caged layer manure and somewhat over 50% in broiler litter. The main non-protein nitrogen component in poultry waste is uric acid. Ruminants such as beef cattle can utilize uric acid and other non-protein nitrogen sources in waste. Thus, the high content and efficient utilization of nitrogen in poultry wastes would make these materials valuable especially as supplemental sources of nitrogen for beef cattle.

Poultry wastes may serve as an important source of energy also in beef cattle feeding. Broiler litter with peanut hulls or wood shavings as base material was shown to contain about 60% TDN, and 2440 kcal. digestible energy and 2181 kcal. metabolizeable energy per kilogram, dry basis, for ruminants.

The average TDN value of caged layer manure has been shown to be 52%, on a dry basis. The values of 1875 and 1911 kcal digestible energy per kilogram, dry basis were obtained in sheep and cattle, respectively. Thus, available energy in broiler litter appears to be somewhat higher than in caged layer waste although the litter is somewhat higher in crude fiber. The layer waste is usually considerably higher in ash content, a reflection of the high calcium needed in the diets of layers for egg production.

The poultry wastes contain substantial levels of calcium and phosphorus. The caged layer waste contains over 3.5 times as much calcium as broiler litter and a little more phosphorus. In formulating rations for beef cattle the wastes could reduce and perhaps remove entirely the need for supplemental feeding of these minerals. The wastes are also rich in most of the trace minerals.

From a complete nutritional standpoint the poultry wastes are potentially valuable sources of nutrients. Based on present feed prices poultry wastes would be worth at least $85.00 per ton, dry basis. However, in order for the waste to be valued at these levels it is essential that the ration be formulated so none of the major nutrients (energy, protein, calcium and phosphorus) would be supplied in excessive amounts.

Arkansas workers, among the first to report concerning feeding of poultry wastes, found that when energy intake was equalized, the rate of gain of fattening steers fed chicken litter was similar to that of steers fed cottonseed meal. Research at Virginia Tech showed that steers fed a fattening mixture containing 25% peanut hull or wood shaving broiler litter plus 2.2 lb. of long hay was similar to that of steers fed a control mixture and long hay. We found also that feeding litter with different base materials, peanut hulls, corn cobs, grass hay and soybean hulls produced similar performance in cattle fed fattening mixtures plus a limited level of long hay. Performance was higher for cattle fed 25% litter, compared to 40%. Broiler litter has also been used successfully to feed growing steers and beef cows.

In Pennsylvania research, performance and carcass quality of fattening cattle fed rations supplemented with autoclaved and dried caged layer waste was similar to that of cattle fed soybean meal. Other workers have reported satisfactory performance in growing-fattening cattle supplemented with dried caged layer waste. Feeding of dried caged layer waste by researchers at Cornell, Michigan and Florida has produced desirable results in dairy cows.

Processing of Poultry Wastes

Processing of the wastes is important to destroy potential pathogens, and in some instances, for storage qualities. Drying of broiler litter by heat treatment has been shown to result in as much as a 20% loss of nitrogen. This loss can be reduced by acidification of the waste prior to treatment. We

found that treating broiler litter with different levels of paraformeldehyde prior to heat drying, and by fumigation with ethylene oxide has not substantially affected the chemical composition.

Due to the limited supply and increased cost of fossil fuel, processes such as ensiling which do not require such fuel, look rather promising. We have ensiled broiler litter at levels up to 45% of the dry matter with chopped whole plant corn forage. We observed good ensiling, with pH of less than 5.0, and lactic acid levels similar to regular corn silage. Incorporating waste in the silage increased the crude protein content of the silage from about 8 to 18% for the silage with 45% litter, dry basis. Voluntary intake of silage containing 30% litter, dry basis by sheep was 69% greater than that of plain silage and the nitrogen from the ensiled corn forage litter was efficiently utilized. Recently, fattening heifers were fed rations consisting of a full feed of either plain corn silage or corn silage containing 30% broiler litter, on a dry basis, and a limited level of grain. The cattle receiving the regular corn silage without protein supplement gained just a little over 1 lb. per head per day. On the other hand, those fed either the protein supplement in addition to regular corn silage or corn silage treated with the broiler litter gained over 2 lb. per day.

Virginia researchers found that ensiling broiler litter containing 19% moisture with high moisture corn grain with 26% moisture in a 1:2 ratio produced a feed containing 20% crude protein, dry basis, compared to 9.4% for corn ensiled alone. The nitrogen in the feed was efficiently utilized by sheep. When the ensiled corn-litter was incorporated in a fattening ration there was a trend for higher consumption by cattle, compared to a ration with soybean meal as protein supplement. South Carolina researchers found that substitution of up to 30% ensiled broiler litter for corn silage increased daily gain in cattle.

From studies in which broiler litter was ensiled with different levels of moisture we found that in order to obtain good fermentation it appears the moisture level should be at a minimum of 40%. In digestibility and metabolism studies with sheep fed a ration containing litter ensiled with 40% moisture the values were similar as for sheep fed a soybean meal containing ration. When the material was incorporated in a cattle fattening ration at a level of 50%, intake was lower, compared to a control ration. It appears from limited research conducted in Britain and in Virginia that in order to get good ensiling a low level of available carbohydrate such as molasses or corn should be included with the litter. South Carolina obtained minimum pH and maximum lactic acid by ensiling broiler litter with 42% moisture.

Most of the research with caged layer waste has been with dehydrated material. The results obtained have been quite satisfactory but as mentioned above, the cost of drying the material may be prohibitive. Wet poultry droppings have been ensiled with grass hay by Pennsylvania researchers. Maximum acidity, lactic acid concentration, crude protein content and *in vitro* organic matter digestibility were obtained with a ratio of 60 parts caged layer manure and 40 parts of hay. It appears that a good way of handling this type of manure would be to ensile the fresh caged layer waste with grass hay or crop residue such as corn stalks, straw, etc.

Effect of Feeding Waste on Quality of Products

Feeding broiler litter or layer waste has not consistently affected quality of the carcass. Likewise, taste tests have shown that feeding the waste does not cause any harmful effect on the eating qualities of the meat.

Effect on Health

There has been no indication of harmful effects in humans consuming meat and milk from animals fed animal wastes.

No disease problems have been encountered from including poultry waste in practical rations for beef cattle, sheep and dairy cattle. In experiments at V.P.I. & S.U. copper toxicity was observed in ewes fed broiler litter containing high levels of copper. The litter, which was fed at levels of 25 and 50% of the ration, contained 195 ppm copper, resulting from feeding high levels of copper sulfate to chicks. Performance of the ewes and their lambs appeared normal until the first fatality in the ewes after 137 days on test. The experiment was terminated at 254 days at which time 65% of the ewes fed the high level of litter and 55% of those fed 25% litter had died of copper toxicity. The copper problem will not be as severe in cattle since they are not nearly as sensitive to dietary copper as sheep. In fact, we have fed beef cows rations containing 80% broiler litter which contained 200 ppm of copper alone and in combination with supplementary copper to equal the amount supplied by the litter for successive wintering periods without any harmful effects. There have been moderate increases in liver copper levels but none were high enough to suspect copper toxicity. The liver copper levels decreased during the pasture season when the animals are not receiving the high copper feed.

A high incidence of abortion was reported in Pennsylvania cows fed low levels of poultry litter in the wintering ration and grazing pasture in the summer which had been fertilized with poultry litter. The litter was found to contain estrogenic activity. The cause of the reproductive problem was not established and the authors suggested a hormone imbalance was involved.

Potential Hazards from Feeding Animal Wastes

The potential hazards of recycling of animal wastes by feeding include pathogenic bacteria, molds, parasites and harmful levels of pesticides, medicinal drugs, trace minerals and heavy metals.

Pathogenic Bacteria and Molds

Animal wastes may contain potential pathogens. Examination of 44 field samples of poultry litter by Canadian researchers for the presense of different bacterial species showed that the samples tested positive for ten different species of Clostridium, two of Cornebacterium, three types of salmonella and various other potential pathogens and yeasts. Other researchers showed that all classes of bacteria, molds and yeast increased with time in broiler litter during the first 8 weeks of use by chicks. Built-up litter which was more than 1 year old contained fewer coliforms, lactobacilli and enterococci than

litter used for 8 weeks.

Although a potential pathogen problem due to bacteria in animal waste does exist, processing waste should destroy these potential pathogens. FDA researchers reported that heat processing of broiler litter at 145 F for 60 minutes destroyed the four organisms studied, namely, S. typhimurium, E. coli, Arizona spp. and S. pullorum. In most of the work in our laboratory on the effect of processing on bacteria, the test which was adopted was one in which the criteria are less than 10 coliforms and less than 20,000 bacteria per gram, by plate count. Treatments which were effective in pasteurizing the litter have been dry heat at 300 F for 20 minutes at a thickness of 1/4"; autoclaving for a minimum of 10 minutes; dry heating at 300 F at a thickness of 1/4" or 1" following the addition of a minimum of 1 g of paraformeldehyde per 100 g of litter; and ethylene oxide fumigation.

Deep stacking and ensiling wastes alone or with other feedstuffs would result in heat and acid production and may offer feasible alternatives to render these free of pathogenic bacteria and parasites. We found that ensiling broiler litter containing 83% dry matter with whole plant corn forage containing 25 or 36% dry matter did not increase coliforms, compared to control silage. The coliforms were decreased when the litter was used with the high dry matter silage, compared to regular corn silage. Virginia workers also reported that ensiling broiler litter with added water so the final moisture level was 20 to 50% eliminated coliforms and reduced total bacteria counts. Ensiling a mixture of one-third broiler litter and two-thirds of high moisture corn lowered coliform numbers to the level in corn grain ensiled alone. Texas workers have shown broiler litter silage tested negative for salmonella, staphylococcus and coliforms. South Carolina workers found that ensiling of broiler litter destroyed salmonella.

Recent research at Auburn indicates that ensiled materials should reach a pH of less than 5 in order to kill salmonella. Apparently due to the high ammonia level it is rather difficult to reach a pH of less than 5 without additional materials such as corn grain or whole plant corn forage. It appears that the addition of small amounts of material such as corn grain or molasses would be helpful.

Drug Residues

Pesticides. Only two of ten samples of poultry litter tested by FDA workers yielded detectable concentrations of DDE (.01 and .02 ppm). Feeding rations containing 25 or 28% dried caged layer manure in Pennsylvania or rations containing 25 or 50% broiler litter in Virginia did not increase pesticide residues in fat of fattening cattle.

Rabon (2-chloro-1 (2,4,5-trichlorophenyl vinyl dimethyl phosphate) is an orally administered insecticide used to control ecto parasites and fly larvae in manure. It appears to be relatively non-hazardous to farm animals, and feeding of this pesticide by U.S.D.A. researchers at levels up to 252 ppm did not usually result in accumulation of it in milk in dairy cows and did not affect general health and reproductive performance of cows.

Medicinal Drugs. The only concern with medicinal drugs in waste would be from animals which are fed these types of drugs. Normally, the main concern would be in the case of broilers since layers are usually not administered significant amounts of medicants. A number of medicinal drugs have been reported by Virginia researchers in samples of poultry litter from birds which were fed these medicinal drugs. Muscle, kidney fat and liver in steers fed rations containing 0, 25 and 50% broiler litter for 121 or 198 days with a 5-day withdrawal were analyzed for amprolium, nicarbazin, chlortetracycline and arsenic. There was a small but consistent increase in liver arsenic in cattle fed rations containing 50% litter but the levels were well below the normally accepted safe levels. None of the other drugs were consistently increased in the tissues compared to the control animals. Poultry litter containing amprolium and 3-nitro-4-hydroxyphenylarsonic acid was fed with or without these additional drugs to lambs in Maine. No residues of amprolium or arsenic were detected in the various tissues. In Texas work no detectable levels of zinc bacitracin, amprolium, ethopabate or 3-nitro-4-hydroxyphenylarsonic acid were reported in muscle, liver and fat of heifers fed broiler litter silage.

There is very little data concerning the levels of heavy metals in animal wastes. There are no data concerning this potential problem in poultry wastes. In studies where this has been looked at, it does not appear to be a serious problem. For example, beef feedlot waste in California was shown to contain 12.7 ppm lead and .61 ppm cadmium, dry basis. When a ration containing 14% of the dry waste was fed, there was actually a trend for lower levels of these heavy metals in the meat of the waste fed animals than the controls.

Potential for Feeding Poultry Waste to Beef Cattle

It appears that beef cattle producers can increase efficiency by judicious use of poultry waste as feed. Caged layer manure or broiler litter could be used to advantage to supply supplementary protein, calcium, phosphorus and limited energy for winter feeding of cows and stocker cattle, and for fattening cattle. The kind of waste and the amount fed would depend on the kind of cattle. For pregnant cows the poultry wastes may be used for a major portion of the ration. For fattening cattle these wastes should be programmed in the rations so that the energy level will not be limited since these are not high in available energy. In the case of stocker cattle moderate levels of the wastes could be used.

It appears that poultry waste can be safely fed to beef cattle. There would not be any serious problem with medicinal drug residues, provided the wastes are withdrawn for a reasonable period of time prior to slaughter. It appears that there are potential pathogens in wastes but the danger from these can be removed by processing, such as heat or chemical treatment, ensiling or deep stacking.

TABLE 1. NUTRIENT CONTENT OF POULTRY WASTES[a]

Component, dry basis	Cage layer waste	Broiler litter
Crude protein, %	28.0	31.3
True protein, %	11.3	16.7
Digestible protein (ruminants), %	14.4	23.3
Crude fiber, %	12.7	16.8
Ether extract, %	2.0	3.3
NFE, %	28.7	29.5
D.E. (ruminants), kcal/g	1893	2440
M.E. (ruminants, kcal)g		2181
TDN (ruminants, %)	52.3	59.8
Ash, %	28.0	15.0
Calcium, %	8.8	2.4
Phosphorus, %	2.5	1.8
Magnesium, %	.67	.44
Sodium, %	.94	.54
Potassium, %	2.33	1.78
Iron, ppm	2000	451
Cobalt, ppm	.0007	
Copper, ppm	150	98
Manganese, ppm	406	225
Zinc, ppm	463	235

[a]Adapted from Bhattacharya and Taylor (1975). J. Anim. Sci. 41:1438.

Organized Cattle Marketing in Virginia

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Before launching into a discussion of our marketing programs, I should first give you a brief description of our beef production programs in Virginia.

Our basic beef enterprise is the cow-calf program. We have about 626,000 beef cows in Virginia. Most of our cows are in herds of less than 50 head and are combined with some other agricultural production such as tobacco and apples. Many cattle producers in Virginia receive income from off-farm employment and maintain a herd of beef cows as a source of enjoyment as well as some supplemental income.

Most calves are dropped in January, February and March and marketed at weaning from the 15th of September until the 1st of December. About all the calves, especially steer calves weighing under 450 pounds at market time, are kept on the farm where produced or sold to another producer in Virginia for wintering.

There are two programs of wintering calves in the state:

One is to winter calves to gain from 200 to 250 pounds during the approximate six months' wintering program. These calves are usually sold in the spring, weighing from 600 to 700 pounds, to go directly to feedlots.

The other procedure is to winter calves to gain only about 100 pounds. These cattle are grazed one season and marketed in September and October as yearling feeders weighing mostly from 700 to 800 pounds and from 15 to 18 months old.

Within the last few years there have been approximately 75,000 head of cattle finished each year within the state. Most of the cattle placed on feed for finishing are 700-900 pound yearling cattle. Indications are rather strong that the finishing of cattle on individual farms and in custom type feedlots will expand rather significantly within the next few years.

The organized feeder calf sales were originally designed to help the cattle producers with small numbers of calves to put together attractive packages in large

enough volume to attract buyers from a wide area. At the Virginia sales the calves are delivered to the local livestock markets on special assigned days. The calves are graded by Virginia Department of Agriculture personnel trained in grading. Calves are individually weighed and penned according to breed, sex, grade and in uniform weight divisions.

At one time we did pen most of our calves on 50 pound weight breaks. In more recent years we've moved to 75 pound weight breaks, and today many of our sales are using 100 pound weight breaks, even on calves. These calves are offered for sale at auction in groups according to how many were placed in a particular pen. We do have provisions for buyers to split pens of more than 20 head.

Most of our feeder calf sales are held from the last week of September through the first part of November. The same procedure is used for yearling feeder cattle sales which are held from the first of September up until the first part of November. Most yearling cattle sold in the fall weigh from 600-800 pounds, but we do sell some weighing from 500-1000 pounds.

Our spring sales are held during the month of April and the same procedure is used for putting these cattle together as is used for the calves. Cattle sold in the spring sales usually weigh from 300-900 pounds and vary considerably in the amount of condition on them, but we do pen them according to grade and uniform weight breaks. In more recent years we've been holding some special sales for yearling type feeder cattle during July to help lighten pastures at the time of the year when they are lease productive. During the early 70's, with the increase in numbers of Holstein steers kept on farms and grown out, special graded sales for Holstein feeders were developed with grade standards written specifically for that type cattle. The Holstein sales were very popular when prices were relatively high, but in more recent years the number of Holsteins available for these sales has not been as great as it was a few years back. We are continuing the Holstein sales at a few locations where numbers are enough to justify this program.

Organizational Structure

As you might suspect, it takes a considerable amount of organization and working together with different agencies, organizations and groups to carry on such a program as I have described. The producers at each sale location have a formal organization set up. Most of these are non-stock, non-profit corporations and were established primarily to relieve any of the officers and directors of any specific liability. These local associations do set up the rules and regulations for their specific sales, select dates in cooperation with the other sales in the state, and make arrangements with their livestock markets and carry on the actual management of the sales.

The Virginia Beef Cattle Association receives 65¢ per head for calves and yearlings sold through the special sales. The primary responsibility of the Beef Cattle Assn. is to carry on the promotion and advertising program connected with the special feeder cattle sales. The Virgnia Beef Cattle Association does also establish a standard procedure under which all the sales connected with the Association must operate. All the special feeder cattle sales in Virginia except one are held at the local auction markets with the markets, in most cases, receiving about their usual commission for selling calves and yearlings. The market provides the facilities, the help, pays the seller and collects from buyers. The Virginia Department of Agriculture, as mentioned earlier, handles all the livestock grading in Virginia, and this is done on a fee basis. At the present time the Department receives 25¢ per head for grading calves and yearlings. The Extension Service is a vital arm of this marketing procedure in that they work with the producer organizations in educational programs and coordinate various aspects of the program.

The programs just described were especially designed for the producer with small numbers and are not the most efficient type of operations that are possible for merchandizing our feeder cattle. We have been trying to develop some new procedures and techniques that might be more adapted to the producer with larger numbers of cattle to sell at one time and also procedures that will be more efficient in moving cattle

from the farms to the next user. One of these procedures has been to grade and package yearling feeder cattle, leave the cattle on the farm, list them on the sale sheet and sell them at one of the special graded sales, giving the buyer 7-10 days to pick up his cattle at the local livestock market. This helps the buyer in that he can get cattle that have not been through the processing procedure through the markets and delayed for two or three days in the marketing process. It also provides the buyer and opportunity to get his transportation lined up well in advance. This procedure also helps the seller in that in most cases the buyer will send his truck directly to the farm, pick up the cattle, move them to the weigh station, weigh them and load them back on the truck to their final destination. This procedure cuts down on the amount of processing at the market and helps reduce shrink and total loss to both seller and buyer. The cattle must be graded on the farm by an unbiased grader and all the information given to the buyers attending the sale.

On-Farm Sales

Producers in North Carolina have, for the past three or four years been conducting on-farm sales, particularly in the spring, for cattle that had been wintered under dry lot conditions. We tried the first on-farm sale this fall in Virginia in which the cattle were owned by two producers. We offered about 400 head of cattle mostly in load lots and all the cattle had been weaned, started on feed and received shots for IBR, PI-3 in addition to Blackleg and Malignant Edema and had been wormed and grub treated. We attempted to group the cattle in load lots, feeling that on the farm it was more important to have a load of cattle than to have them all as uniform as they might be in a pen at a graded sale. The on-farm sale was scheduled at 10:00 a.m. in a series with other feeder cattle sales in the area at the same time, and we did sell a few groups that were less than load lots. The buyers accepted this and went on to one of the graded sales in the area and filled their load. The two producers who sold their cattle together in this on-farm sale paid the Virginia Beef Cattle Association, the graders and the livestock market the same fees they would have had they delivered their cattle to one of the special graded sales. As the present time we feel that we

should have at least 400 head of cattle from not more than four producers in order to have a successful sale out on the farm.

Grading at Weekly Markets

Some of our larger markets request the Virginia Department of Agriculture to provide graders during the heavy marketing season of the fall, and the markets grade and comingle ownership of feeder type cattle with, the owners' permission. There are no prior arrangements or rules and regulations connected with this type program. The market operator just makes it available to the sellers during the heavy marketing season of the fall. This comingling of cattle by grade, breed, sex, etc. does cut down on the selling time and makes for much larger packages than when cattle are sold in ownership groups.

Tele-Auction Sales for Feeder Cattle

The tele-auction sales are conducted by conference telephone arrangement and are basically for the producers that can offer uniform groups in larger numbers - that is, least 20,000 pounds of uniform cattle - and it is preferred to have at least a load of 40,000 to 45,000 pounds from a single producer. The cattle to be sold in the tele-auction sales must meet the same requirements as cattle going to the Virginia Beef Cattle Association sponsored sales. These cattle are graded on the farm by Department of Agriculture graders and we identify the cattle with the grade markings stamped on them. We prefer to have the cattle in a load with not more than 150 pound weight spread and not more than two grades. If the seller wants to combine breeds we advise with him on what will work together best and what won't, but it's still up to the seller to offer as many breeds in a load as he wants to. Information on each load of cattle is assembled by the sponsoring organization and this is sent to the Virginia Beef Cattle Association and the Association's Executive Secretary provides this information to a select list of buyers. We feel that you should have at least five or six loads of feeder cattle in order to have a successful tele-auction sale. Information on each load of cattle is mailed to the select list of prospective buyers and these individuals

are also called just a day or two prior to the sale to make sure they want to be on the telephone. Each buyer is assigned a number and he bids by number. The livestock market provides the telephone facilities, actually conducts the sale, pays the seller and collects from the buyers. The seller agrees to deliver his cattle to the weighing station on the date and time that the buyers request. The buyer is given 10 days to pick up his cattle and he takes possession of them at the pre-designated weighing station. The market will arrange the trucking and send the cattle to the buyer if so requested. We have had as many as 18 different buyers on one tele-auction sale scattered over seven states.

The same organizational set-up is used in conducting the tele-auction sales as is used in handling the sales where the cattle are assembled. The tele-auction procedure has been used for selling feeder pigs for several years and, in more recent years, it has also been used to sell slaughter type cattle, cull slaughter cows, lambs, and cull ewes.

The tele-auction procedure is certainly convenient for the buyer, but it is very obvious that the buyer must have a great deal of confidence in the organization with which he is dealing, the livestock market and all those involved, because in most cases he does not see the cattle until they arrive. This also means that the graders and everyone involved must be completely fair, honest and sincere in all aspects of this procedure. If handled correctly, this marketing procedure can be a real benefit to the livestock industry.

USING ALL AT YOUR COMMAND -- FEED ADDITIVES AND CROP RESIDUES

W. B. Anthony and R. R. Harris

The presentation was a condensed version of what could and perhaps should have been said under the title "Using All at Your Command". The wish is that we have caused you to reflect, just a little, on the complex nature of "beef production" under a very competitive setting.

Under Feed Additives a brief statement is presented concerning those "feed additives" that are most frequently mentioned and in current use. The listing is not exhaustive.

Crop residues are summarized under appropriate general headings.

In the discussion we emphasized also the need for you to make use of the valuable information summarized in the publication entitled "Nutrient Requirements of Beef Cattle" developed and published under auspices of the National Academy of Sciences. This publication is your guide for feeding cattle. If you will refer to it and make use of the information it contains, new vistas for profitable cattle management will open to you.

Feed Additives

RUMENSIN (Monensin) - A product manufactured by Elanco Products Co., Division Eli Lilly and Co. and approved for use in rations for feedlot cattle to improve feed efficiency. We have tested this product in Alabama under grazing and feedlot conditions. Our data indicate an improvement in feed efficiency for cattle full-fed high energy rations in dry lot. The improvement in feed efficiency averaged 23%. Feeding Rumensin to cattle on summer pasture did not signigicantly improve performance over the control group of cattle. Many experiments conducted at many locations throughout the United States have been completed and the results published. Results have been generally favorable for the use of Rumensin for cattle fed for rapid growth. The improvement in feed efficiency may be expected to approach 10% or greater. The manufacturer's recommendation chould be carefully followed.

UREA AND NPN -- The proper use of urea and other NPN sources in rations for cattle and sheep will usually lower the cost of the ration without lowering the efficiency with which the feed is used for productive purposes. The Alabama livestock producer should always consider the use of urea and other NPN sources when formulating rations. A pound of protein in soybean meal currently costs about 22¢. In contrast the current cost of a pound of protein equivalent in urea is about 3¢, a difference of 86%. For beef cattle rations, about 1.5 pounds of supplemental protein are added to 100 pounds of feed. Therefore, the feed cost savings per hundred pounds of feed when urea is substituted for soybean meal is currently about 29¢. It is necessary to follow good nutrition practice when formulating rations with urea. Available energy and the amount of protein present in the basal misture should guide the level of addition of urea. However, urea and other NPN sources can be successfully used with low energy and high energy rations. Also, urea and NPN can be used effectively for growing animals as well as for mature cattle.

BLOAT GUARD -- Bloat is primarily a nutritional disease that afflicts cattle grazing legume pastures and, too frequently, those on full feed in dry lot. BLOAT GUARD, a product of Smith, Kline and French, can be used effectively for the control of both kinds of bloat. The degree of bloat prevention will usually be greater for bloat induced by legume pasture. Slime production by undesireable rumen microorganisms is usually the cause of bloat in feedlot cattle. BLOAT GUARD is helpful in reducing the degree of bloat in feedlot cattle. This statement is based upon the advise of Dr. Earle Bartley Department of Dairy Sciences, Kansas State University, who is responsible for much of the developmental information on the use of BLOAT GUARD. The proper use of antibiotics could be helpful in overcoming feedlot bloat. However, no specific recommendation can be given. New drugs to control feedlot bloat are in the developmental stage. BLOAT GUARD is available in several forms--blocks, granules, and liquid. The livestock producer should follow the Manufacturer's recommendation.

ANTIBIOTICS -In general these valuable drugs should be used to treat diseases. Low level, continous antibiotic feeding is practiced with varying degree of benefit.

PROTECTED FAT - In normal fashion rumen microorganisms hydrogenate dietry fat and the saturated fat passes to the lower gut to be digested. Since the fat is saturated in the rumen the ruminant animal normally absorbs only saturated fatty acids. By protecting fats against hydrogenation in the rumen, the premise is that unsaturated fats will be absorbed. The beneficial aspects is judged to be less saturated fat in the beef carcass.

"Protected Fats" are for sale. Benefits to accrue to the beef producer from use of "protected fat" appear minimal.

PROTECTED PROTEIN - Feed proteins can be specially processed through use of chemicals and heat to reduce their digestion by rumen bacteria. The protected protein bypassed rumen digestion, is digested in the small intestine. The process has some merit and will be further developed through research. Some NPN or non-protected protein should be fed along with protected protein.

This is a relatively new area of research. It probably has most usefulness in feeding high producing dairy cows.

MAGNESIUM FOR GRASS TETANY PREVENTION - Beef cows nursing young calves are prone to develop tetany when grazing cool season annual or perennial grass pastures. The disease can be essentially eliminated by feeding approximately 56 grams (2 ounces) of magnesium oxide per head daily. It is important to initiate magnesium feeding prior to turning the animals to pasture.

Magnesium can be offered in mineral mixes, as a slurry sprayed on the pasture, or by suspending in a liquid protein supplement Properly managed anyone of these methods may be used with success.

Recently Dr. Carl Hoveland and his associates in the Department of Agronomy and Soils have been studying certain components of plants and soil types that influence the level and availability of herbage magnesium. It may be that this research will lead to a more positive control of the grass tetany syndrome.

Crop Residues

CULTIVATED CROP RESIDUES

CORN STOVER - Each acre of corn harvested for grain will yield approximately one ton of stover. Corn stover will usually

contain about the same feeding value as grass hays. It is deficient in protein and mineral. For greatest feeding value, it should be ground and enriched with essential nutrients.

In 1975 Alabama farmers harvested 660,000 acres of corn for grain. This acreage could have yielded 660,000 tons of stover worth about 33 million dollars.

Corn is the crop more livestock producers should grow for cattle feed. It is Alabama's BEST FEED CROP -- it will normally return more feed units per unit of input than any other crop. The October, 1976 issue of PROGRESSIVE FARMER magazine reports the success story for corn under the title "CORN BOOMS IN THE SOUTH". The Editorial staff of the PROGRESSIVE FARMER has done the livestock producer tn the South a great service by calling to our attention in a very forceful manner the great potential in corn production in Alabama and its corollary greater feeding efficiency for beef production.

The livestock producer should grow corn and use the grain for post-weened calves and conserve the stover for the brood herd.

Consider corn and corn stover----you will be joyfully surprised at the success.

PEANUT FORAGE - In 1975 Alabama farmers harvested 206,000 acres of peanuts. Each harvested acre could have yielded one ton of forage equal to alfalfa hay in feeding value. Thus, 206,000 tons of hay worth about $75.00 per ton was largely lost in Alabama in 1975-- $15,450,000.00.

Research at our Wiregrass Substation, Headland, Alabama identifies the feeding value of peanut forage. This research also reveals how this valuable product can be conserved for feeding. In past times the peanut forage has been harvested ahead of the nut harvest with a forage chopper and stored as silage or dehydrated pellets. Currently the forage is harvested behind the combine and put in large, round bales. It is important to store baled peanut forage under a roof because it quickly deteriorates if left outside.

Peanut forage is a valuable feed that need be conserved. Your cows can effectively use it to produce more and better beef at lower cost.

SOYBEAN STOVER - In 1975 Alabama farmers harvested 1,310,000 acres of soybeans. About one ton of crop residue could have been conserved

from each harvested acre of soybeans. Soybean stover is not nutritionally as valuable as corn stover or peanut vines. However, it has feeding value equal to poor quality hay and it is easy to process for use in milled feeds. Also, the feeding value of the soybean stover can be improved if it is harvested immediately behind the combine and by a process that conserves the pods and cull and broken beans.

At an estimated value of $30.00 per ton, the potential value of soybean stover produced annually in Alabama amounts to 39 million dollars.

SORGHUM STOVER - Alabama does not harvest a large acreage of sorghum for grain. In 1975, 40,000 acres were harvested and this represents 40,000 tons of forage potential for livestock feed. Sorghum stover has feeding value equal to or superior to most of our grass hays. The market value of the sorghum stover would be over one million dollars.

SUMMARY OF CULTIVATED CROP RESIDUES- Cultivated crop residues in Alabama amount annually to double the state hay crop production and they have an estimated annual value of 88 million dollars.

A COW WINTERING RATION USING CORN STOVER COULD BE FORMULATED AS FOLLOWS:

Ingredient	Amount %
Ground corn stover	88
Cane molasses	10
Urea	0.5
Defluorinated phosphate	1.0
Salt, trace mineral	0.5
Vitamin A	1000 I. U./lb.
Mcal ME/lb.	.837

The most valuable use of crop residue would be to blend with animal waste and store as wastelage. Information about this process can be obtained by visiting or calling The Animal and Dairy Sciences Department.

FOREST PRODUCT RESIDUES - Sawdust has actual and potential value as an animal feed. Hardwood sawdust can constitute the primary fiber source in a high energy feed for finishing cattle for slaughter. Auburn research showed that in a steer fattening ration, oak sawdust was equal to Coastal bermudagrass hay at a level of 15 percent or lower.

Chemical processing of sawdust to yield a useful animal feed is being developed at Auburn University. Economic feasibility for converting sawdust to an animal feed is largely contingent upon the supply of more conventional feeds and their production cost.

Liquid waste from pulping plants could represent a relatively large amount of animal feed. Lignin sulfonate already is being used to extend feed grade cane molasses. It does not have the same feeding value as cane molasses, but it can substitute for part of cane molasses when the latter is in short supply. Other liquid products from wood pulping plants will soon be available as animal feed. The supply of these may be very great; use patterns need further development.

The sawdust supply in Alabama is approximately 574,644 tons annually.

SUMMARY

"Using all at your command" was the overall title of this section of the 1976 Beef Industry Conference. For you as beef producers this title has an unusual and special meaning. Can you continue to produce beef when directly confronted with the overwhelming competition for resources to meet the domestic and world demand for more food and more of all the many and varied services we have come to expect for a happy, satisfying, and stimulating life style? The odds against your success are frightening. The usual measurements of efficiency in producing animal products for food, ranks beef at the bottom of the listing. Dairy products lead the efficiency listing, but a close second and third are broiler meat and eggs. In terms of protein production, milk is 5 times and broiler meat 4 times more efficient to produce than beef.

But take another look--Cattle are ruminants; cattle can be used as scavergers; they convert feeding stuffs useless to people into delectable and nutritious foods. Beef will be relied upon for a signigicant portion of the worlds' food supply because the beef cow is a scavenger and converts useless food products into human food. The challenge to the beef producer can be stated as follows:

Use creative ability to achieve "Maximum Assimilable Nutrients produced per unit of Land and these rationed to cattle to create efficiency."

Avail yourself of the valuable information contained in the publication produced by the National Research Council, National Academy of Sciences under the title NUTRIENT REQUIREMENTS OF BEEF CATTLE, 1976 edition.

BEEF CATTLE OUTLOOK

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"To make money, buy some good stock, hold it until it goes up and then sell it. If it doesn't go up, don't buy it."

...Will Rogers

Cattlemen throughout the U. S. are in their third year of a severe cost-price squeeze. The effects of the cattle price drop, production cost increase, energy crunch and economic recession are too well known to need repeating. The question of more concern to cow-calf producers and cattle feeders is, "What happens next?" More specifically, cattlemen are asking, "When will we see the recovery we've been expecting?"

The best answer possible now is: Recovery will come in 1977 -- probably. Let's look at the reasons why looking in more detail at each segment in the beef production-marketing process. I'd like to do this in reverse order from that often used by cattlemen -- by looking first at consumers, then at packers, followed by feeders and cow-calf producers.

Consumers Enjoy Large Beef Supplies

American consumers have had large quantities of beef available from 1974 on, and have not spent any larger percentage of their disposable incomes than 20 years ago (Table 1). Retail beef prices did reach relatively high levels at times in 1973, 1974 and 1975, but consumer incomes had also risen, so that the proportion of disposable income spent for beef remained about stable (Table 1).

Beef consumption will reach a record 128 pounds (carcass weight basis) this year, but retail prices dropped from 1975 levels, to about $1.39 for all cuts of choice beef the first 11 months of 1976. Fed beef made up a greater share of total beef supplies this year than last. About 65 percent of 1976 beef production will be fed beef, compared with 58 percent last year.

Retailers have maintained wider margins this year, and have received considerable attention for it.

Packers See Some Profits

After large losses during 1973-74 in particular, meat packers have begun to realize some profits on their beef operations. Losses experienced during the high-price, low-price roller coaster period from late 1973 through mid-1975 have been widely publicized. Plants closed, or reduced kill and the resulting drops in demand and prices were passed back to feeders and cow-calf producers.

Table 1.--Per capita beef consumption, and percent of disposable income spent for beef, U. S.

Year	Per capita beef consumption		Percent disposable income spent for beef
	Carcass weight	Retail weight	
	----------Pounds----------		
1955	82.0	60.7	2.58
1960	85.1	63.0	2.67
1965	99.5	73.6	2.43
1970	113.7	84.1	2.48
1971	113.0	83.6	2.43
1972	116.1	85.9	2.55
1973	109.6	81.1	2.56
1974	116.8	86.4	2.59
1975	120.1	88.9	2.58
1976 (est.)	128.0	94.7	2.45

Source: Livestock and Meat Situation, Livestock and Meat Statistics, ERS, USDA.

Large nonfed beef supplies, along with periodic excess fed beef production has kept pressure on carcass beef and slaughter cattle prices. This pressure has eased some this fall and beef is moving well in retail and wholesale trade. Cold storage supplies have become a more significant factor than in earlier years, and have apparently contributed to some of the volatility in carcass beef-slaughter cattle markets.

Cattle Feeders Still on Roller Coaster

Has not man hard service on earth,
and are not his days like those of a hired laborer,
like those of a slave longing for the shade
or a servant kept waiting for his wages?
So months of futility are my portion,
troubled nights are my lot.
...JOB 7:1-3

Cattle feeders have suffered many troubles, and there is no certainty that those difficulties are over. Feed supplies are relatively large and feed prices are down from earlier highs. However, many cattle coming out of feedlots this fall and at least through the end of this month were bought at and over $40 per cwt., and will need $47 to $50 to break even.

Feeders did realize profits from many cattle fed during 1975. This improvement, after 1974, apparently encouraged so many feeders to increase production that fed beef supplies became burdensome this

year, and prices were depressed. Feeders are putting more cattle into lots than during the past two years, and prospects are more encouraging than in some time.

Cow-Calf Producers Still Hurting

Farmers and ranchers in the cow-calf business steadily reduced their herds during 1975 and 1976. Feeder cattle and calf prices have been below production costs since the summer of 1974, and cattlemen have cut back in an effort to regain a profitable position.

Producers have cut back on the cost side wherever possible also. Supplemental feed and fertilizer use has been reduced substantially in response to depressed cattle prices and soaring costs for feed, fertilizer and other non-farm inputs. Of course, these reduced input levels will reduce total production and productivity, probably for at least two more years. Calf crop percentages and calf weaning weights will probably be lower than if pre-1973 levels of feed and fertilizer had been used.

Outlook

What is ahead in 1977, and farther down the road? Let's concentrate on the basic segment of the beef industry underlying all the rest -- the cow herd.

Cattle Cycles and Cattlemen

Everyone concerned with the cattle business knows about the cattle cycle -- the ten-year up-and-down swing of cattle numbers and the opposite movement in prices.

The cattle cycle is healthy and about on schedule. U. S. cattle producers increased herds since 1958, with sharp increases in 1971 (Figure 1). Southeastern cattlemen increased beef cow numbers more rapidly than the U. S. average. In 1974, beef and pork supplies were at high levels, consumers' incomes were not growing rapidly due to recession and inflation, and cattle production costs were too high to encourage further expansion.

All these contributed to the sharp decline in prices and resulting cow herd reduction during 1975 and 1976 (Figure 2). The January 1, 1977, inventory will probably show about 121 million head of cattle and calves in the U. S., about the 1973 level. There will probably be some slight reduction during 1977 as well.

With this cutback in cattle numbers, and likely stability at about current levels for grain prices, 1977 should be a better year for cow-calf producers and cattle feeders. If the current cycle behaves like those in the past, 1978 through 1982 will be generally favorable years for producers and feeders.

Naturally, many things can happen -- world weather can alter grain suppply -- price conditions, oil and energy relationships can shift and other major events outside our control can change conditions. However, based on matters internal or directly related to the beef industry, my estimate of considerable improvement in prices and profits beginning in 1977 stands.

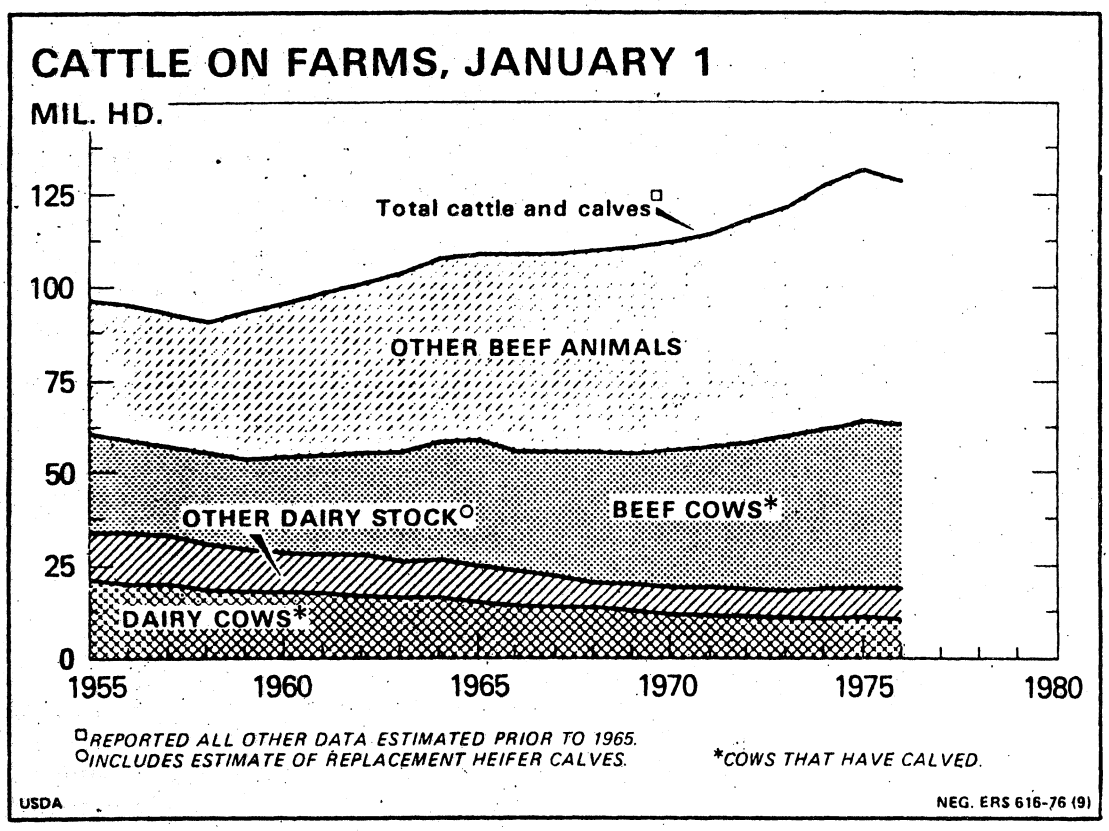
Pork Supplies to Affect Beef and Cattle Prices

Just as the beef cycle is operating, so is the hog cycle. This four-year fluctuation brought a peak in supplies and large liquidation in 1974. Buildup began this year, and pork supplies are still increasing. Breeding plans will probably be curtailed, but most of next year's market hogs are already here or on the way. With about 64 pounds (carcass weight) of pork per capita expected in 1977 along with 121 pounds of beef, red meat supplies next year will be only slightly less than in 1976.

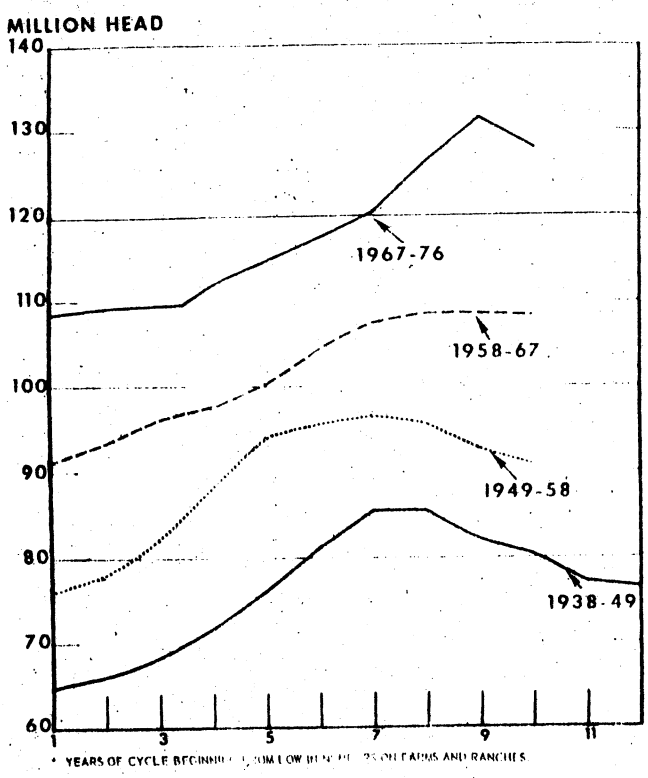
1977 Cattle Prices

More fed and fewer nonfed cattle will be marketed in 1977 than this year. Choice slaughter steers will average about $43-$45 per cwt. compared to the 1976 average of $39. First quarter steer prices will probably be $42-$44, with April-June prices $45-$47. Since these feeder cattle, and their feed were somewhat lower priced that fed cattle marketed in late 1976, feeders will realize some modest profits.

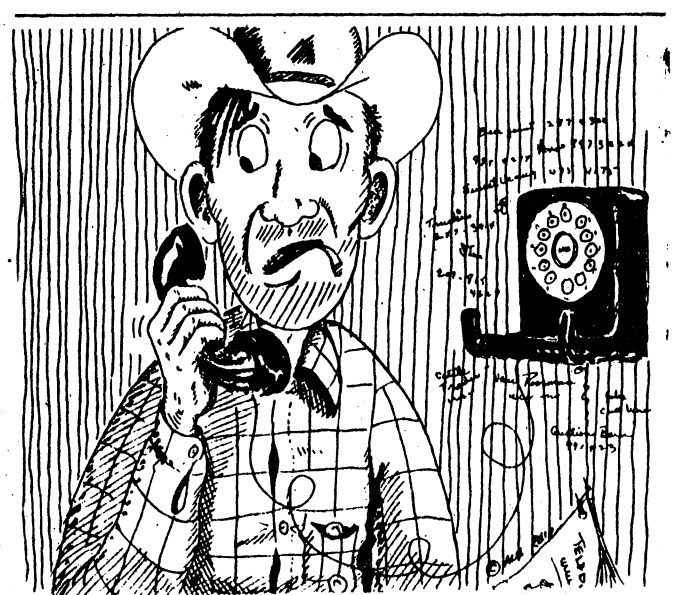
Feeder cattle prices will follow the fed cattle market. Feeding costs will be high enough to keep feeder cattle prices from reaching high levels, but feeder cattle numbers will be somewhat smaller than in recent years. On balance, Southeastern feeder steer prices (500-700 pounds) should be $37-$39 early in 1977, reaching $38-$40 per cwt. by spring.



CATTLE ON FARMS BY CYCLES



* YEARS OF CYCLE BEGINNING FROM LOW IN NUMBER OF CATTLE ON FARMS AND RANCHES



"Hurry up, Sheriff, somebody's broke into my pasture with a gooseneck full of cattle and they're tryin' to unload 'em!"

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