DATA PROCESSING OF BEEF CATTLE PRODUCTION RECORDS

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The Department of Animal Science at N.D.S.U. has been processing beef cattle production records sent in by NDBICA members since 1962. The charge is 20 cents per cow annually. A total of 296 different herds and 101,456 weaning weight records have been processed. In general, the average weaning weight of the calves whose weights were processed, has increased with time. The retention rate of the participating herds is fairly high. In 1977, the amount of information sent back to the producers was increased.

Since 1962 the Department of Animal Science at North Dakota State University has been processing the beef cattle production records sent in by members of the North Dakota Beef Cattle Improvement Association. The NDBCIA is a nonprofit organization interested in the practical and scientific use of beef cattle production records.

The processing at NDSU involves summarizing and evaluating weaning weight, yearling weight, and grade records to provide the beef producer with information useful for making genetic selection and management decisions. Members of the NDBCIA are charged 20 cents per cow annually for the processing of weaning weight and grade information. The charge is only 10 cents per cow when the NDBCIA member participates in the program for the first time. The beef producer typically receives his report one to two weeks after the information arrives at NDSU. The number of weaning weight records that have accumulated through 1976 is 101,456. In 1977 the amount of information sent back to the beef producers was increased.

One result of this change is that summaries became available concerning average weaning weights and number of records and herds processed during the last 14 years. A total of 296 different herds have been processed. The numbers of herds processed (presented in table 1) has increased steadily. The maximum number of herds handled in any year was 149 in 1973. The maximum number of weaning records processed was 16,144 in 1974.

The average weaning weight of the calves whose weights were processed has fluctuated, but, in general, has increased with time. The average adjusted weaning weights by year are given in table 1. The actual weaning weights are adjusted so as to account for differences in dam age, sex, and calf age. The 10, 167 calves in 1976 represent about 5 million pounds of market weight or about $2 million if the calves were sold for $.40 per pound.

A summary of the number of years of participation in the record processing service for those herds that submitted records in 1976 is shown in table 2. Fifteen herds participated for the first time while two herds had sent in records for the past 14 years. Seventeen herds had participated for five years. The retention rate of participating herds is fairly high. Of 95 herds that sent in records in 1976, 17 had skipped one or more years. In other words, 17 herds had not taken advantage of the service at least one year from the time the herd's records were first processed.

The most important changes affected in 1977 are the inclusion of birth weight summaries and approximate genetic evaluations for adjusted weaning weight of the dams and sires. Previous production information of the sires and dams is also provided. The producer receives all information at the same time. These changes represent a further step in the direction of providing more sophisticated genetic evaluations and management information to the producer on a regular basis.

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Table 1. Summary of Number of Herds Processed, Number of Records Processed, Average Number of Calves Per Herd, and Average Adjusted Weaning Weight for the Last 14 Years.

Year	No. of Herds Processed	Total No. of Weaning Weight Records Processed	Ave. No. of Records Processed Per Herd	Ave. Adjusted Weaning Weight
1963	21	1228	58	454
1964	27	1728	64	447
1965	36	2157	60	436
1966	41	2622	64	455
1967	55	3676	67	469
1968	77	5887	76	496
1969	80	5958	74	486
1970	86	6691	78	473
1971	104	9375	90	472
1972	124	11260	91	472
1973	149	14751	99	490
1974	130	16144	124	480
1975	99	9812	99	483
1976	95	10167	107	499

The genetic evaluations are based on within-year comparisons of progeny groups. For each identified sire and dam the average number of pounds the progeny records are below or above the herd's yearly averages is calculated. These averages are then weighted in such a way as to account for the heritability of adjusted weaning weight and the number of progeny. The result is a genetic evaluation for adjusted weaning weight for each identified sire and dam. The individual weaning weights of the sires and dams cannot be used at the present time because sometimes the identification of the animal changes from the time it is a calf to the time it is a parent. This lack of unique and permanent identification is a troublesome and unfortunate problem because it means that a valuable source of information cannot be used. It is important that sire identification be recorded if possible so genetic selection from the male side of the pedigree can take place.

Table 2. Number of years of participation for herds that were processed in 1976.

Years of Participation	Number of Herds
1	15
2	4
3	7
4	20
5	17
6	3
7	7
8	3
9	6
10	3
11	2
12	3
13	3
14	2

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control flooding and store the water for beneficial use. Various plans were proposed to the Government and in 1944 a Missouri River Basin Flood Control Act became law. Known as the Pick-Sloan Plan, it authorized the construction of large dams on the Missouri River. Water stored in the reservoirs would reduce flooding downstream and provide water for hydro-electric generation, downstream navigation, irrigation, municipal and industrial use, recreation, fish and wildlife enhancement. Congress, in preparing the enabling legislation, was aware of the divergent interests in the development and use of water resource. Downstream states, principle beneficiaries of flood control, recognized the two Dakota's would give up over a million acres of mostly river-bottom land for water storage reservoirs. To partially off-set this loss of productive land, they supported allocation of a portion of the stored water for irrigation development and the use of revenue from the sale of hydro-power generated at the dam sites to pay for a major portion of the irrigation project construction costs.

The original plans for irrigation in North Dakota were for lands in the northwestern corner of the state. As feasibility investigation proceeded in the late "forties" and early "fifties" it was determined that soils and topography in that area were not suited for the then proposed surface irrigation.

Investigations shifted eastward to the drift prairies in the central part of the state where soils suitable for irrigation were identified. For the most part, they are the coarse textured soils with low water holding capacity and thus most frequently plagued by drought. To develop this area for irrigation in lieu of that originally proposed required Congressional re-authorization of the project. Appropriate legislation was enacted in 1965. Since then construction of the major water delivery feature, the 76-mile long McClusky Canal, has been essentially completed. On May 11, 1977, a court agreement between the Audubon Society and the Secretary of Interior halted construction until a new supplemental environmental impact statement could be prepared. It has since been released with public hearings recently held. Proponents continue to be the elected officials of the State of North Dakota, the Garrison Diversion Conservancy District, irrigation districts and municipalities and others who would receive water from the diversion as well as those supportive of resource development. Opponents included some landowners in the land acquisition area for canals, some of the wildlife interests and others who oppose any change in the environment resulting from alteration in use of the land or water resource. With the exception of the landowners, the basic concern is the potential loss and/or alteration of wetlands which provide habitat for reproduction of migratory waterfowl and other species of birds.

Construction of major project works for irrigation coupled with some farm land drainage associated with irrigation development does not change the land use pattern. Federal law requires that wetland loss resulting from project development be replaced in kind. This is a recognized and planned feature of the Garrison project along with additional planned improvement of some existing wetlands. A problem is the criteria for determining what is wetland loss and what lands are suitable as replacement. It is not an exact science and judgements differ. At stake is not only the amount of land resource required to replace bonafide wetland losses, but the project itself as envisioned and planned. Some wetlands are suited to alternate use and others are not. Most common has been drainage of potholes that can be cultivated and used for the production of agricultural commodities. One acre of good wetland habitat will produce 1.1 ducks per acre. If this acre is drained and farmed as dryland it may produce 30 to 40 bus/ac. of wheat. Or, if drained to allow construction of project works and irrigation, one irrigated acre will yield enough corn and alfalfa hay to produce 1,000 pounds of beef based on research results at the Carrington Irrigation Station.

To equate the production of 1.1 ducks with the 30 to 40 bushels of wheat or 1,000 pounds of beef may seem ludicrous. Land use for either of the latter suggests a substantially greater economic benefit. However, it is argued by many that land use for duck propagation and other wildlife species is of greater value to society than wheat or beef. This view is in effect supported by Federal law in instances where Federal funds are used for irrigation and other similar projects. Basically, the law requires that any natural wetlands that are destroyed or damaged be replaced in kind. There are similar requirements of the law that apply to other proposed changes in land use.

To appraise the value of land in terms of its esthetic value for migratory waterfowl propagation versus the economic value for food stuff production is most difficult. Nevertheless, it is apparent that society must come to grips with the problem of value assessment particularly when the ultimate use of a land and water resource is at stake. At the moment, there is a surplus of food, but will there be in twenty or twenty-five years when the Garrison Project is planned for completion? By then the need for food could be critical, suggesting that now, when planning and building, we must seek accommodation of different interests and possibly even propose changes in the laws pertaining to land use for specific purposes.

As a start it would be appropriate to arrive at some mutually agreeable criteria by which the value of wetlands can be appraised. At the present time the 12,000 acres in the McClusky Canal right-of-way can not be credited with either mitigating or replacing wetland losses. It is argued that its value has not been established. Yet, a doctoral thesis concerned with measurement of migratory waterfowl production on a twenty-three mile stretch of I-94 right-of-way in North Dakota suggests production levels equal to or greater than that in more natural habitat. Surely, if a 200 to 300 foot wide strip of fenced land bisected by four lanes of concrete can support such production, the canal right-of-way should have equal or greater capability. Also, it should be recognized that sprinkler irrigation does not require the drainage features necessary for surface irrigation which was originally proposed for the Garrison project and apparently the basis for estimating wetland losses. Actually, based on observations at the Carrington Irrigation Station, there is evidence that migratory waterfowl production has been enhanced where the center pivot sprinkler systems are used.

As one concerned with not only irrigation development and appropriate land use, but also with preservation and maintenance of wildlife it seems essential that a more rational and reasonable approach must be taken than that currently demonstrated if society is to realize optimum esthetic and economic benefits from development and use of its and and water resources. Failing to recognize different views and the need for seeking accommodation of divergent positions can only result in stalemate and a net loss to all concerned. To do this would be a tragedy. It should be obvious to everyone that our two most basic natural resources, land and water, must be developed to their fullest potential for multiple purposes if our society is to persist and prosper.