

Executive Summary

I began the project with broad literature searches, to cast a wide net. The key words, “bison” and “buffalo” turned out to be just that; the (inter)net brought in information about cities in New York, all kinds of animals from around the world, a productive researcher in health medicine name Bison, and insight into nuclear physics, that among other things has bison particles. Subsequent cross-searches between databases, and independent key work searches on authors and content of garnered publications created a database of approximately 2,000 entries, with high confidence that I haven’t missed something significant.

I used the software EndNote to organize and categorize the database. Information or publications that were not available to me via on-line, internet searches were obtained by interlibrary loan and personal visits to the libraries of North Carolina State University. Dr. Murray Woodbury and Vern Anderson provided material from their personal digital libraries.

Table One. EndNote Groups and sub-Groups

| Group | Sub groups | Group | Sub groups |
|--------------------------------|-----------------------------------|-------------------------|---|
| Physiology | | Management | |
| | Anatomy | | Bison in parks |
| | Blood chemistry | | Management practices |
| | Body and tissue composition | General overview | |
| | Digestive tract | | General overview |
| | Growth and Development | | Theses and Dissertations |
| | Homeostasis and metabolism | Reproduction | |
| Genetics | | | Reproduction female |
| | Genetics and growth | | Reproduction male |
| | Genetics general background | | Reproductive behavior |
| | Genetics phylogeny | Feeding and Nutrition | |
| | Molecular genetics | | Digestion and metabolism |
| | | | Energy, protein and minerals |
| Diseases and health management | | | General feeding and nutrition |
| | Anaplasma | | Intake, digestion and metabolism |
| | Anthrax | | Grazing behavior and selection |
| | Brucellosis | Miscellaneous and other | |
| | Diseases unclassified | | Anthropology, archaeology and phylogeny |
| | General disease reviews | | Bison bonasus |
| | Malignant Catarrhal Fever | | Grasslands |
| | Mycobacterium bovis | | Meat and other products |
| | Mycoplasma | | Other |
| | Parasites | Behaviour | |
| | Paratuberculosis/ Johne’s disease | | Bison and other animals |
| | Pasturella | | Management practices |
| | Pasturella | | |
| | Viral diseases | | |

The EndNote database has the advantages of popularity, versatility, and availability. I believe free versions can be downloaded and operated on any computer connected to the internet. The EndNote file is compatible with a spectrum of other software packages, including Microsoft Word and Excel. All entries have some keywords to allow users to search on topics of interest. I gathered pdf copies of practically all the entries, allowing quick access to the publications. The database is transferable by internet, including pdf files. The EndNote database is categorized in the several 'groups', Endnote's way of facilitating searches, and allowing individual publications to be classified in multiple categories. I also created an internal classification that should allow broad categorical searches on any platform.

Table Two. Categories within the dataset

| | | |
|--|--------------------------------------|----------------------------|
| Anatomy | Diseases | Grasslands |
| Anthropology, archaeology and Phylogeny | Anaplasma | Grazing behavior selection |
| Bison bonasus | Anthrax | Growth and development |
| Bison in parks | Brucellosis | Homeostasis and metabolism |
| Bison and other animals | Diseases unclassified | Management |
| Blood chemistry | General disease reviews | Meat and other products |
| Body tissue composition | | Reproduction female |
| Digestive tract | Malignant Catarrhal Fever | Reproduction male |
| Feedstuffs and nutrition | Mycobacterium bovis | Reproduction behavior |
| General behavior | Mycoplasma | Theses and dissertations |
| General overview | Parasites | |
| genetics | Paratuberculosis/ Johne's disease | |
| | Pasteurella | |
| | Viral diseases | |

Almost all entries have specific information on author, title, source (year, volume, issue, pages), and a pdf file copy. Transcription of the EndNote file to other software with similar goals and features should retain all of this information. I can provide pdf copies of publications separately, identified by author, year, and source (not titles).

The bulk of published work in the general topic of bison falls into 4 categories: archaeology, anthropology; diseases and health management; behavior, including social, grazing, reproductive behavior; and publications from industry magazines over the past 30 years. These categories contain recent publications and application of state-of-the-art research tools and technologies. Categories with lesser activity include: physiology (other than reproductive); genetics; growth and development; work that focuses on European bison; meat and other bison products; and nutrition. I allowed the sources of information to guide and shape this report, with the following exceptions. First, I decided not to explore archaeology and anthropology in detail. Secondly, I have omitted description and discussion of work done with European bison, except where I thought it was relevant to the subject at hand, mostly in the area of diseases. Third, although I perceive management of private herds to be a topic of high interest, I decided that interested parties could and should go to the information in the industry magazines for specific topics rather than simply copying them into a final report. Further, most of that information was published over 15 years ago, and may or may not be relevant today.

The final report is written in the form of a scientific article, with references and literature cited at the end of each section. I have summarized and presented information in tables and figures to provide analysis, and interpretation. I made a conscious effort to avoid jargon, and to provide explanations or descriptions that would allow a non-scientist, a.k.a. a normal person, to read with some comprehension.

Key take-home points from my perspective are 1) we have a good understanding of the basic reproductive, digestive, and growth physiology, metabolism, and behavior of bison; 2) we have profited, and will continue to profit, from application of molecular biological techniques to improve understanding and application of the genetic background and future of bison today; 3) in terms of breeding and feeding, they are similar enough to cattle that application of concepts and techniques from cattle by in large will work, or at least will not cause damage. Advances in understanding nutrition and metabolic systems will come from new and innovative ways to obtain samples and metabolic information from bison without causing artifacts from stress caused by interaction with humans. Statistical confidence in research results will come from well-designed, replicated experiments with adequate animal numbers.

Gerald Huntington

A handwritten signature in cursive script that reads "Gerald Huntington". The signature is written in black ink and is positioned below the printed name.