



SOUTH DAKOTA STATE UNIVERSITY

Center of Excellence for Bison Studies | SDSU Extension

Bison Body Condition Scoring Field Guide

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Body Condition Scoring

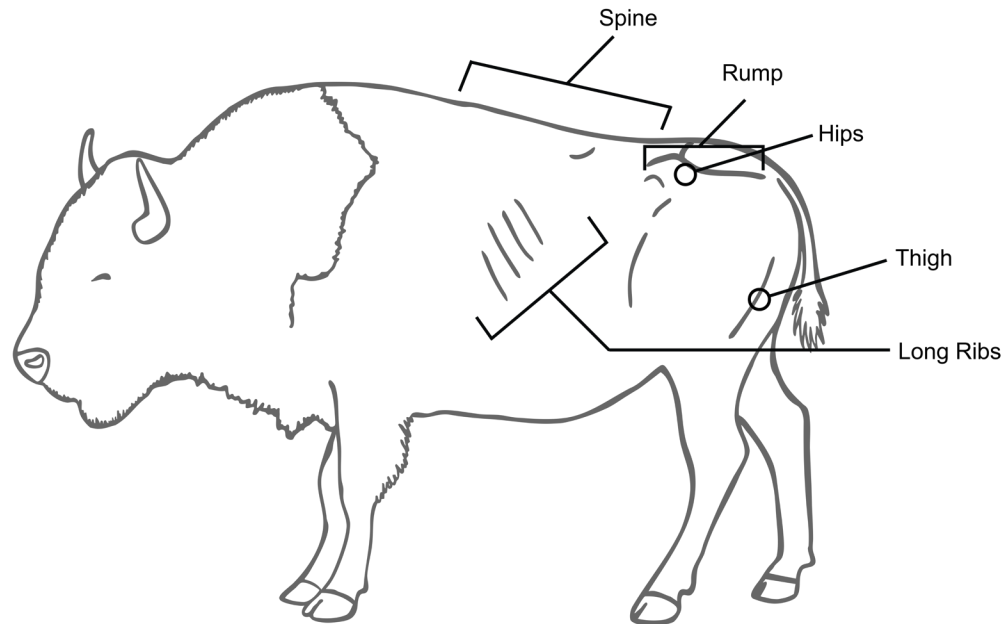
What is it?

Body condition scores as defined by the NRCS are a tool that determines the relative fat cover or energy balance of livestock. The system is generally based on the extent of soft tissue around bony structures. Scores assigned to the animal can range from 1 (emaciated) to 5 (obese). Five key areas of the bison body have been identified to assess BCS including the spine, rump, hips, thigh, and long ribs. Each body region is scored separately and then averaged to result in the individuals overall BCS. In production settings, animals should optimally score 3.5 and in conservation settings, animals should optimally score near 3.0. **However, scores naturally fluctuate throughout the seasons of the year.**

Why use BCS?

Body condition scoring is an effective management tool as it allows managers to safely assess the health of their bison non-invasively. This system allows managers to gain valuable insights to help improve herd well-being, optimize management and enhance productivity. It is important to monitor rapid changes as this may indicate injury, illness, or environmental stressors. As an example, emaciated animals may be indicative of poor nutrition, gastrointestinal parasite infestation, or disease infection BCS also has significant implications for reproductive success in cow bison—scores of 4 or higher may indicate excessive fat at calving, while scores of 2 or lower are associated with reduced fertility. These assessments assist in informing management decisions, including the need for targeted health interventions at both the individual and herd level.

Key Regions

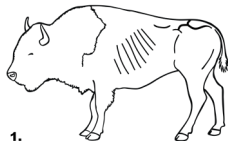


Scoring should focus on these areas of the bison. Key areas to focus on are **spine, rump, hips, thigh, and long ribs**. These regions have been shown to reduce variability when comparing the scores from between multiple observers (Zielke et al., 2018).

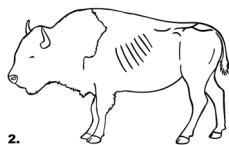
Body Condition Scoring

BCS for bison are based on a five-point system:

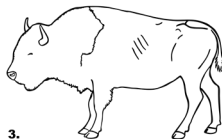
1. Severely emaciated, bone structure of long ribs & spine are all very visible.
2. Thin, no fat around ribs, and some muscle is still visible. Spine is easily visible.
3. **OPTIMAL 3:** Last two long ribs cannot be seen, some evidence of fat in ribs and spine appear rounded.
4. Too much flesh. Fat cover is thick and spongy across the body. Short ribs are very smooth.
5. Severely obese, back very square, heavy fat pockets around tailhead. Overall square and bubbly appearance.



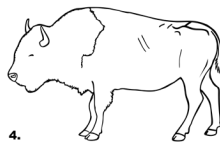
1. Severely emaciated: bone structure very visible; lacking fat and muscle tone.



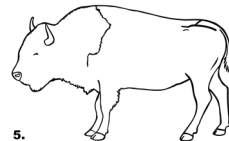
2. Too thin: no fat but some muscle is visible.



3. Optimal: some evidence of fat so that most regions appears rounded and partially filled in.

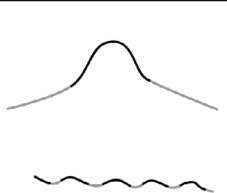
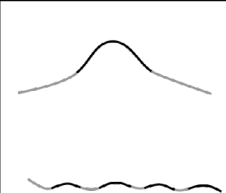
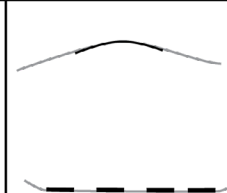


4. Too thick. Fat cover is thick and spongy in each body region.



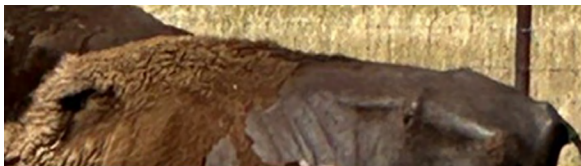
5. Severely obese, back very square, heavy fat cover. Overall square and bubbly appearance.

Spine

BCS	1	2	3	4	5
Spine					

The spine can be viewed from either from behind or from the side. The individual bones along the spine should ideally be slightly visible, but not prominent; muscle sloping away from the spine should be moderately filled. A bison with spine scoring a 1 would appear to have very sharp, visible bones and steep-angled muscle. A bison with spine scoring a 5 would have bones that are not visible and buried in fat and muscle has little slope and flattened profile.

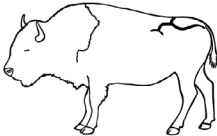
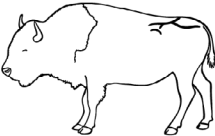
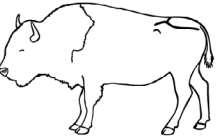
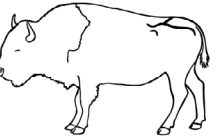
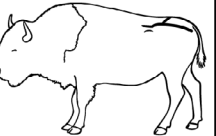
BCS: Spine = 1



BCS: Spine = 4

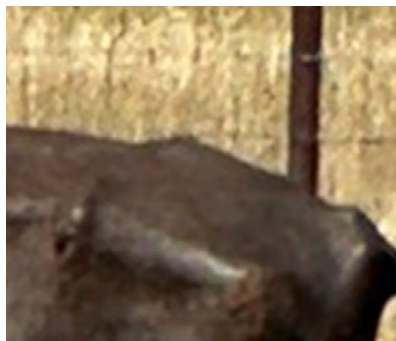


Rump

BCS	1	2	3	4	5
Rump					

The rump is best viewed from either side of the body. The bones should ideally be slightly visible, but not sharp. The rump muscles should be flat and angular. A bison with a rump scoring a 1 should have muscles that are caved-in. A bison with rump scoring a 5 would be covered in fat and no bones visible; rump is full and bulging-out.

BCS: Rump = 1



BCS: Rump = 5



Hips

BCS	1	2	3	4	5
Hips					

The hips are best viewed from behind. The hip bones should ideally be slightly visible, but not sharp. The muscle sloping away from the hips should be flat and angular. A bison with hip scoring a 1 would have very sharp, prominent edges that are sharp and muscle is caved-in. A bison with hip scoring a 5 would have bones that are not visible and buried in fat; rump is full and bulging-out.

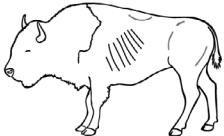
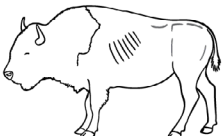
BCS: Hips = 1



BCS: Hips = 4



Ribs

BCS	1	2	3	4	5
Long Ribs					

The ribs are best viewed from the side of the body. The ribs should ideally be slightly visible in summer (not visible with winter coat) with 3-4 ribs showing but not sharp or distinct; edges should be round and fleshy. A bison with ribs scoring a 1 would be prominent with many ribs visible in both summer and slightly less visible in winter. A bison with ribs scoring a 5 would not be visible in summer or winter; and buried in fat.

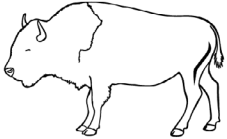
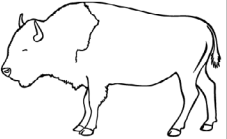
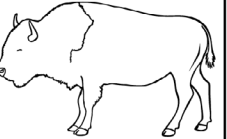
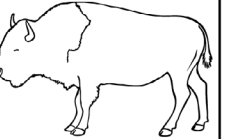
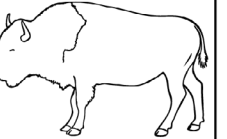
BCS: Ribs = 1



BCS: Ribs = 5

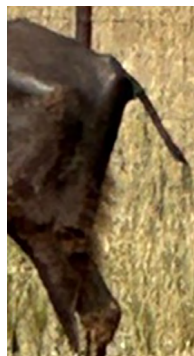


Thigh

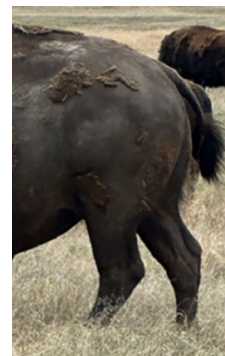
BCS	1	2	3	4	5
Thigh					

Thighs are best viewed from the side of the body. The thigh depression (sulcus line between the quadriceps and hamstring) should ideally be slightly visible, but not prominent; muscle should be moderately filled. A bison with thighs scoring a 1 would appear to have a very deep sunken depression with visible bones of the hip and rump. A bison with thighs scoring a 5 would have no visible thigh muscle depression, buried in fat.

BCS: Thigh = 1



BCS: Thigh = 5



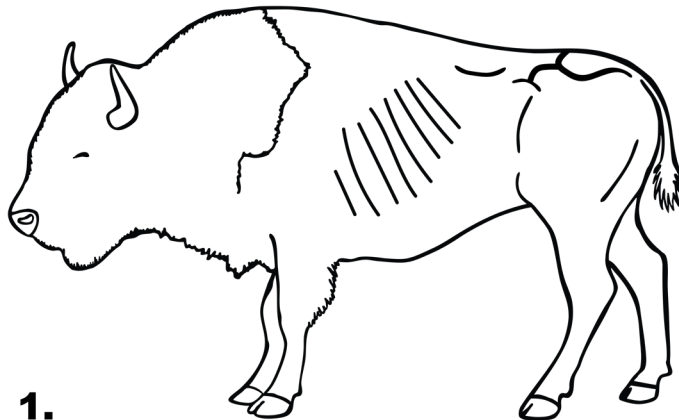
BCS Details

BCS: 1

Scores of 1 can generally be defined as severely emaciated, bone structure of shoulders, ribs, back, hooks and pins are very visible.

Ribs: Prominent, many ribs visible in summer, visible but less distinct in winter.

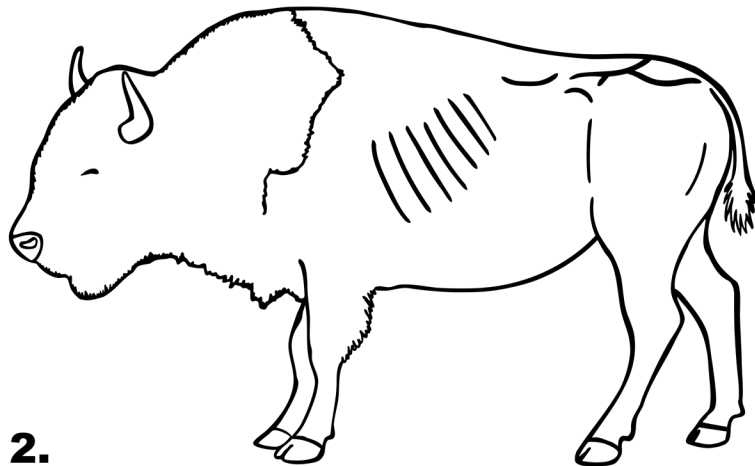
- Spine: Backbone very sharp, steep angle of muscle.
- Hips and Rump: Hip bone prominent, edges very sharp, rump muscles caved.
- Tailhead: Devoid of fat, deep, sunken depressions on either side of tail head. No fat palpable if bison in squeeze.
- Hump: Sharp top line, narrow with flat sides when viewed from front, sharp contrast between hump and shoulder when viewed from side. Overall, the individual looks thin relative to others.



BCS: 2

Scores of 2 can generally be defined as very thin no fat on the brisket or ribs, and some muscle still visible. Backbone is easily visible. Ribs: Some ribs visible in summer and winter

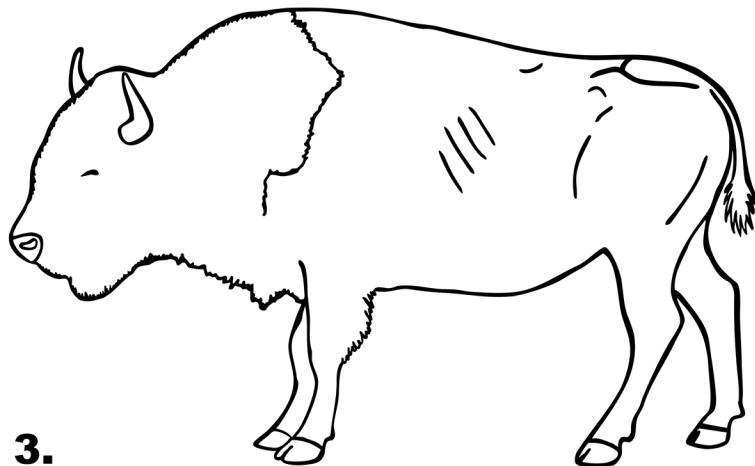
- Spine: Backbone evident, but not sharp, steep angle of muscle.
- Hips and Rump: Hip bone readily seen, edges sharp, rump muscles cave in slightly.
- Tailhead: sunken depressions on both sides of tail head. Small amount of fat palpable if bison in squeeze.
- Hump: Hump is narrow, but not sharp. Sides flat when viewed from front. Distinct contrast between hump and shoulder.
- Overall, the individual looks moderately thin relative to others.



BCS: 3

Scores of 3 are ideal. They can generally be defined by the last two ribs cannot be seen, some evidence of fat in the brisket, ribs and back appears rounded.

- Ribs: Edges round, covered in flesh, may be visible, but not sharp or distinct in summer. Not visible in winter.
- Spine: Backbone visible, but not prominent, angle of muscle has moderate slope, similar to roof of tent.
- Hips and Rump: Hip bone visible, but not sharp, rump muscles flat and angular.
- Tailhead: Slight hollowing on either side of tail head. Some fat palpable if bison in squeeze.
- Hump: Well-developed but not bulging. Noticeable distinction between hump and shoulder.

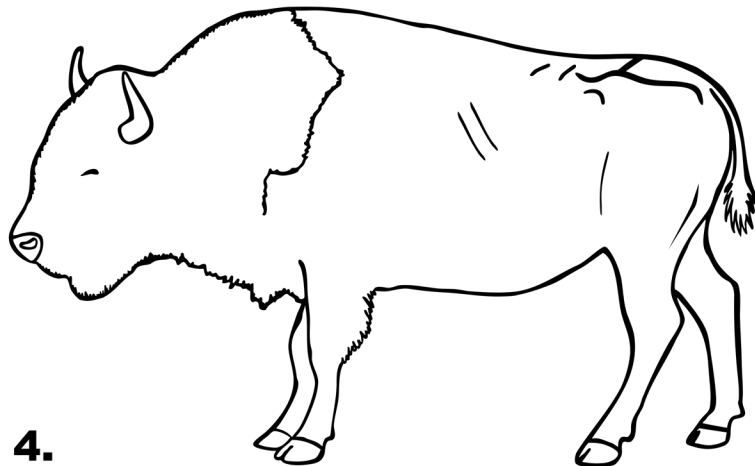


BCS: 4

Scores of 4 can generally be defined as very good flesh, brisket full. Fat cover is thick and spongy. Ribs are very smooth.

- Ribs: Individual ribs generally not visible in summer, not visible in winter.
- Spine: Backbone not readily seen, angle of muscle has gentle slope.
- Hips and Rump: Hip bone barely visible, muscles full, but not bulging.
- Tailhead: Slight depression in bulls, no depression in cows.
- Hump: Full hump when viewed from front, but not round and bulging. Little distinction between hump and shoulder when viewed from side.
- Overall, the individual looks moderately fat relative to others.

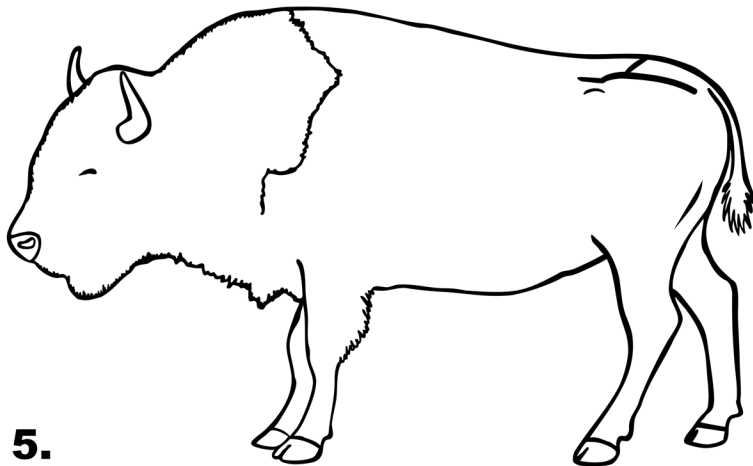
4.



BCS: 5

Scores of 5 can generally be defined as obese, back very square, brisket distended, heavy fat pockets around tailhead. Square appearance

- Ribs: Covered in fat, not visible in summer or winter.
- Spine: Buried in fat, backbone not visible, angle of muscle has little slope, flat.
- Hips and Rump: Hip bone covered in fat, not visible, rump rounded out, full.
- Tailhead: In bulls, no depression on either side of tail head. Either side is bulging with fat in cows.
- Hump: Thick, rounded top when viewed from front, blends into the shoulder when viewed from side.
- Overall, the individual looks fat relative to others.



Impacts of Body Condition Scores

BCS and reproduction: scores above 4 indicate that cows will have obesity related calving issues, cows less than 2 experience reduced fertility.

- Cows with a BCS > 4 are prone to reproductive diseases.
- Low body condition scores and rapid changes may indicate poor nutrition, gastro-intestinal parasite infestation, or disease infection.
- Low body condition scores can result in lower efficiency of converting forage into energy requiring supplementation.
- High body condition scores can also indicate metabolic problems.

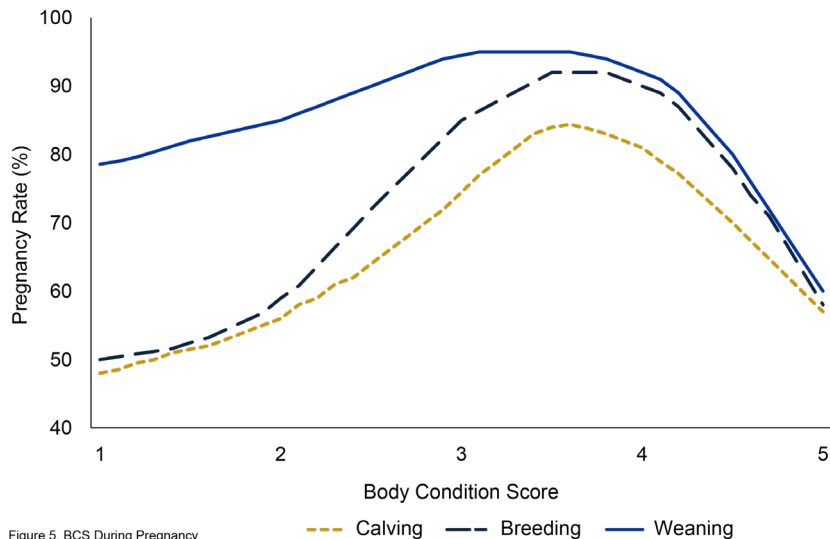


Figure 5. BCS During Pregnancy

Recommendations

Conservation-oriented herds should strive for an average BCS of 3.1 for the herd, while production-oriented bison herds should strive for an average BCS of 3.8 for the herd.

One unit of BCS is equivalent to about 90 pounds of live tissue weight.

Scoring is quick but subjective.

Body condition scores are generally negatively related to dry matter intake.

Bison BCS Recommendations						
	Ideal BCS for Conservation* focus:			Ideal BCS for Production* focus:		
Stage of Production (time frame; months)	Cow	Heifer	Bull	Cow	Heifer	Bull
Weaning (Nov - Apr)	4 > 2.5	4 > 3	4 > 3	4 > 3	4 > 3	4 > 3
Pre-Calving (Apr - Jun)	2.5	3	3.5	3	3.5	3.5
Prior to Breeding (Jun - Nov)	3	3	2.5	3.5	3.5	2.5
Gestation/Pre-winter condition (Sep - Nov)	4	4	3.5	4	4	4
* Conservation and production focused operations are separated to better guide the bison manager's decisions. > Indicates a downward trend of body condition score over winter due to harsh conditions (this is normal in bison).						

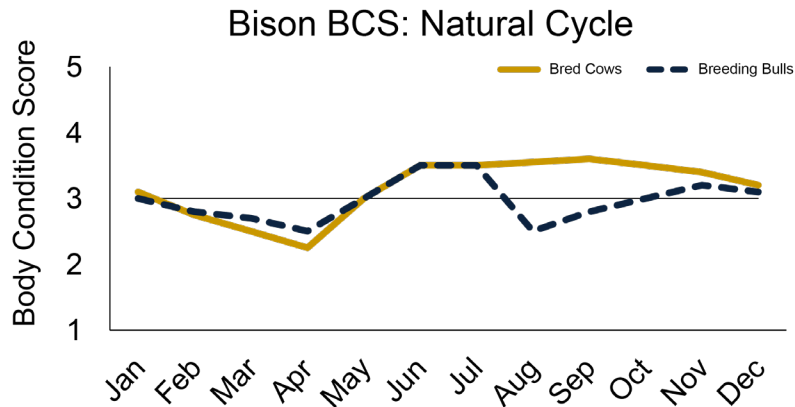


Figure 3. BCS by Month

Resources

Center of Excellence for Bison Studies, South Dakota State University

National Bison Association 2015. The bison producer's handbook: a complete guide to production and marketing, National Bison Association. Westminster, CO.

USDA, 2016. Health and management practices on U.S. ranches-bison operations, 2014. Fort Collins, Colorado.

USDA NRCS, 2021. South Dakota, Natural Resources Conservation Service, Body Condition Scoring – Bison. https://www.nrcs.usda.gov/sites/default/files/2022-11/Bison_Worksheet.pdf

What's the Score: Bison Development and Assessment of a Body Condition Score Scheme for European Bison (Bison bonasus)

Berezowski et al 2019. Bison Diseases Field Guide Hunter et al Bison Field Necropsy Guide Feist 2000 Basic Nutrition of Bison

Martin, JM, and C.B. Brooke. 2021. Getting Started with Bison Ranching

Norman. Bison Body Condition: Management tool to monitor the nutritional status of the bison cow

Simpson, B., Hilken, T., Martin, J. M., Whitman, L., Boll, T., Green, S., et al. (2024). Conservation planning with bison producers. US Dep. Agric. Nat. Resour. Conserv. Serv. 190-BIO-94, 1–41. doi: 10.13140/RG.2.2.14250.12489

Zielke et al. 2018. Development and assessment of a body condition score scheme for European bison (Bison bonasus).