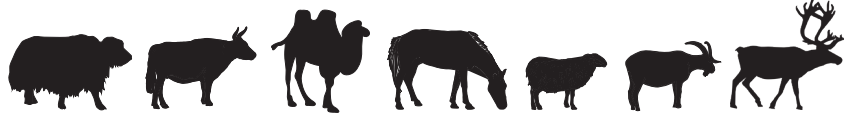


MONGOLIAN DAIRY LIVESTOCK



Mongolia is a land of camels and...more camels!



CAMELS

Camelus bactrianus, also known as the Bactrian camel (тэмээ), is a two-humped camel that is native to the Gobi desert of southern Mongolia. It was traditionally used to pull heavy loads, and its milk is made into khormog, a light alcoholic drink.

THE DNA SEQUENCE BELOW IS FROM THE CYTOCHROME C OXIDASE 1 (COX1) GENE IN CAMEL. THIS GENE PERFORMS ESSENTIAL FUNCTIONS IN THE ENERGY PRODUCTION OF CELLS. THE COX1 GENE SEQUENCE IS DIFFERENT IN DIFFERENT ANIMAL SPECIES, AND BY SEQUENCING THIS GENE IT IS POSSIBLE TO DETERMINE THE SPECIES OF AN ANIMAL.



1

A partial sequence of the cytochrome C oxidase 1 (COX1) gene is shown below. Part of the sequence is highlighted in **BOLD**. This part of the sequence is 32 nucleotides long, and it is different in each of the major dairy animals in Mongolia.

Camelus bactrianus, cytochrome C oxidase 1 (COX1) gene sequence (partial):

ATGTTCACTACTCGCTGATTATTCTCAACCAACCACAAAGATATTGGAACCTCTACCTATTATTTGGAGCTTGGGCTGGAATAGTAGG
AATAGGACTAAGCTTATTAATTCGCGCTGA**ATTGGGACAGCCCGGGACGTTGCTTGGAGACG**ACCAAATCTATAACGTAGTTGTAACAG
CTCATGCTTTCGTCATGATCTTCTTTATGGTAATGCCAATCATGATTGGAGGCTTCGGGAACCTGACTGGTCCCCCTAATAATTGGAGCC
CCGATATGGCGTTCCCCCGCATGAATAATATGAGCTTCTGACTGCTGCCTCCCTCATTCTTGCTACTACTAGCATCATCTATAGTTGA
AGCAGGAGCAGGTACAGGCTGAACCGTTTACCCTCCCCTAGCCGGAACCTGGCACACGCAGGCGCCTCCGTCGATTAACTATTTTCT

2

Below, we've shown this sequence again in comparison to the DNA sequences found in other dairy animals. This is called an **alignment**. Differences in the DNA sequences between the different animals are highlighted in pink. This sequence is like a **DNA fingerprint** of the animal species.

Cattle
Yak
Sheep
Goat
Reindeer
Camel
Horse

ATTAGGCCAACCCGGAAC**TCT**GCTCGGAGACG
ATTAGGCCAACCCGGAAC**CTG**CTCGGAGACG
A**CT**AGGCCAACCCGGAAC**TCT**ACTCGGAGAT**G**
A**CT**AGG**T**CAACCCGGAAC**CTA**CTTGGAGAT**G**
A**CT**GGGCCAAC**CTT**GGGACC**CTA**CT**CG**GAGACG
ATTGGGACAGCCCGGGACGTTGCTTGGAGACG
ATTAGGCCAAC**CTT**GGGACC**CTA**CT**AG**GAGAT**G**



3

Can you make a DNA bracelet with the CAMEL sequence? Use your beads and string to make a CAMEL DNA bracelet!

A T T G G G A C A G C C C G G G A C G T T G C T T G G A G A C G