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**Title:** Isotopic analysis of dietary patterns in northern China from the Proto-Shang Period to the Qin Dynasty
**Issue Date:** 2017-11-09
SUMMARY

Here, the stable isotope ratios of carbon ($\delta^{13}$C), nitrogen ($\delta^{15}$N) and sulphur ($\delta^{34}$S) are measured to examine human diet, social stratification, mobility and animal husbandry practices. Three locations comprising four sites from the Yellow River Valleys of north China are investigated: Nancheng (Hebei Province), Xishan (Gansu Province), Liyi and Shanren (Shaanxi Province), and this work represents one of the largest and most detailed isotopic research projects ever conducted in China.

At the Proto-Shang (ca. 2000-1600 BC) site of Nancheng, the isotopic analysis of humans (n=83) and animals (n=36) indicates that millet was the dominant grain used for both human food and animal fodder, and that individuals ate varying levels of animal protein, primarily pigs but also cows and possibly dogs. Sheep/goats and deer were not main sources of animal protein in the human diets, and this suggests that these animals were used for their secondary products, labor or as sacrificial offerings. In addition, no social stratification related to diet in this transitional Neolithic to Bronze Age society was found. This indicates that the social stratification of later periods, such as during the Shang and Zhou Dynasties, possibly had yet to be established during this period.

At the Late Western to Early Eastern Zhou period (ca. 700-400 BC) site of Xishan, the isotopic results of the humans (n=33) and animals (n=58) reveal that millet farming was important to this early Qin population. This finding supports the view that the early Qin people were a more settled and agricultural based society, rather than a nomadic and pastoral based society. Individuals of high status had significantly elevated $\delta^{15}$N results compared to the middle or low status individuals, and this is possible evidence that they were having more animal protein in their diets compared to the common people. In addition, significant differences in both mean $\delta^{13}$C and $\delta^{15}$N values were also found between females and males. The females consumed a diet mainly based on millet and pork, while the males had more diverse diets that were a mix of C$_3$ and C$_4$ plants and different animals, both wild and domestic. Further, sacrificed individuals were analyzed, and the results indicate that it might be possible to identify the social rank or identity of these individuals.
At the Mausoleum complex of the First Emperor of China, Qin Shi Huang, humans from two Qin Dynasty (221-206 BC) sites, Liyi (n=146) and Shanren (n=14) as well as animals (n=9) were isotopically investigated. The Liyi site represents the local workers or craftsmen of the Mausoleum complex, whereas the Shanren individuals were slaves or prisoners who were forced to do hard labor, and were buried in a mass grave. The large isotopic differences between the two sites suggest that the Shanren individuals were possibly from the south of China, and they had diets with decreased amounts of millet and domestic animal protein compared to the Liyi individuals. Thus, the large isotopic differences in carbon, between populations of north vs. south China, make it possible to track the migration of individuals between these two regions.