

## Letter to the Editor

## Sheep in Greece, from antiquity to modern livestock and the Dementia in Sarakatsani herds

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In Hellenic antiquity sheep were used as a livestock, in sacrifices rituals, as gifts to an important person or a god, in magic, in symposia and in daily nutrition. The idea of someone to torture, mutilate and kill a live animal may seem as a rather strange and brutal concept in the mind of an ordinary people, but it is ritually documented in ancient Greece. Sheep as an animal kind is surrounded by a wide variety of traditional uses. You may take an oath by killing a sheep, and pray that you shall be treated like one if you violate the oath. You may sacrifice a sheep to cast an erotic spell or put a curse upon a person [1]. To offer sheep to be sacrificed in an altar to please gods and then participate in a symposium was a most usual form of gratitude for having a plentiful livestock and you donate some to the gods and the people participating in prayers [2]. Reports exist for sacrificing sheep to Apollo, the god of light, epidemics and medicine. Although infrequently, sheep were offered to the patron god of medicine Asclepius, as an offering to be sacrificed in an altar, or as a gift to the priests serving the god [Figure 1] [2-3].

Shepherds and sheep is a famous folklore image since the bronze era in ancient Greece. Inside the first written Hellenic documents, in the Homeric epic poem of *Odyssey*, we encounter the savage Cyclopes tribe which breeds sheep. Despite the emphasis given on the Polyphemus Cyclops' cruelty and barbarism, the bond between shepherd and sheep is evident, in a greater passion than among Greeks, whose only impulse was to slaughter and eat them. The poet emphasizes on the fact that sheep have much more to offer to their owners [14].



Figure 1. Stone votive relief stele, family visiting Asclepius and sacred Snake (dual nature of the god). Family offers sacrificial lamb, 5th-4th century BC, Berlin Museum of the History of Medicine.

Such a Mediterranean people who care about the sheep is the pastoral communities of Sarakatsani in continental Greece. Among Sarakatsani, sheep are being tended by men, while women only milk goats. Sheep for Sarakatsani provide everything, from wool, meat, milk and income. Sheep are sacred and as shepherds pass most of their time next to them in the mountainous countryside, avoiding long visits in towns [5]. There are reports since the 1960's for an alien behavior of mountainous sheep of the kind *Ovis aries*. The intense observation of Sarakatsani, demonstrated by the fact that those sheep are considered to belong in a generation above the 5th by measuring the sheep being born. A recessive gene may alter the white sheep color and in some cases a black sheep, named *laia*, or *laios* (meaning black) is born. Sarakatsani believe that those sheep do not demonstrate such a

deviated behavioral pattern, which on the other hand was demonstrated by white sheep in old age. Two forms of symptomatology had been observed. The first, is the sluggish (hypotonic), with the sheep called “dumusarika” (nonchalant, indifferent), which they stay behind and do not follow the rest of the herd especially in spring and summer (free grazing in the mountains), while staying aside in winter due to their confinement in stables. They stop grazing, lose weight, most probably don't see or hear, their bodies shrank and they lay down for hours and despite human efforts, they ultimately die. The second is the hypertonic with sheep being called in the language of the herdsmen, “seritka” (slow heavy movements, excitable). This form appears at a younger age, with sheep being nervous and anxious, keeping their heads up, going back and forth, moving away from the herd, usually to fall off the cliffs or be eaten by the wolves. Sarakatsani shepherds [Figure 2] having encounter dementia syndromes among them, as they lived almost isolated, succeeding long age and having limited cognitive reserve, connected this peculiar behavior with dementia. By connecting these sheep with a degenerative brain disease, they have been avoiding eating the ill livestock.



Figure 2. Sarakatsani shepherd Christos E. Voulgaris and his flock, Keleria area, 1965.

Science today, demonstrated through various studies the AD-associated neurofibrillary accumulation (tau pathology) in normal aged sheep. The presence of neurofibrillary tangles in aged sheep brain has been established, while the Alzheimer’s disease itself has been recognized. Sheep have a face recognition system, live in communities, are trained in behavior and have a brain in volume and complexity similar to human, thus constituting a perfect candidate for dementia syndromes observation, or for clinical trials and possible gene manipulation to confront mental diseases [6]. Dementia which have been for decades been observed by Sarakatsani, do exist in sheep and may in the near future by their study to present promising results for the confrontation of dementia syndromes.

## References

1. Faraone CA. Ancient Greek Love Magic. Harvard University Press, Cambridge, 2001.
2. Rutherford I, Hitch S. Animal Sacrifice in the Ancient Greek World. Cambridge University Press, New York, 2017.
3. Johnston PA, Mastrocinque A. Animals in Greek and Roman Religion and Myth
4. Lewis S, Llewellyn-Jones L. The Culture of Animals in Antiquity. A Sourcebook with Commentaries. Routledge, New York, 2018.
5. Wolf ER. Religion, Power and Protest in Local Communities. The Northern Shore of the Mediterranean. Mouton, New York, 1984.
6. Reid SJ, Mckean NE, Henty K, Portelius E, Blenow K, Rudiger SR, Bawden CS, Handley RR, Verma PJ, Faull RLM, Waldvogel HJ, Zetterberg H, Snell RG. Alzheimer's disease markers in the aged sheep (*Ovis aries*). *Neurobiol Aging* 2017;58:112-119.