

## PICA (DEPRAVED APPETITE; ALLOTROPHAGIA) IN DOMESTIC ANIMALS AND MAN

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### INTRODUCTION

Pica or allotrophagia is a peculiar condition of depraved or perverted appetite, whereby the animals or humans start eating objects that they normally do not eat (Anderson, 1994; Akgul *et al.*, 2000). The word pica comes from the Latin name for magpie, a bird known for its unusual and indiscriminate eating habits. The condition is seen in cattle, buffaloes (particularly pregnant and lactating) and occasionally in other animals such as pigs, horses and goats. Cows in calf and young cattle are especially liable to develop this condition.

Pica is also frequently seen in human. The description given by Dorland's Illustrated Medical Dictionary (Anderson, 1994) on pica in human reads as follows:

"Compulsive eating of nonnutritive substances, such as ice (pagophagia), dirt (geophagia) gravel, flaking paint, clay, hair (trichophagia) or laundry starch (amylophagia). Pica and unusual food cravings (citta) are common in pregnant women. Pica also occurs in some patients with iron or zinc deficiencies. In children this syndrome, classified with the eating disorder in DSM-III-R, is a rare mental disorder with onset typically in the second year of life; it usually remits in childhood but may persist into adolescence".

### Etiology

The causes of pica in animals are not well understood. Depraved appetite or licking of surface generally indicates a lack of some ingredient in the ration, or it can be a vice or bad habit. It is probably due to indigestion and dietetic errors that are difficult or impossible to specify. It has been suggested that insufficiency of soda salts or phosphates in the food may cause this problem (Whitlock *et al.*, 1975; Smith *et al.*, 2000). Trace element deficiencies, in particular copper, zinc and cobalt, have been incriminated in the etiology of alopecia and wool eating habit in sheep (Fahmy *et al.*, 1980; Meyer and Lohse, 2002). It has also been associated with a nervous derangement, probably interfering with nutrition. In some animals, pica is a reflection of boredom, as animals kept singly suffer more frequently than those kept in groups. In some lactating buffaloes, pica may be a sign of subclinical ketosis. Ketosis-associated pica is

characterized by refusal of concentrate but the continuation of eating of roughages (Ranjhan and Pathak, 1992).

Evidence suggests that there may be several causes of pica in human. One widely held theory points to iron deficiency as a major cause of pica. Other reports suggest that pica may have a psychological basis and may even fall into the spectrum of obsessive-compulsive disorders. Pica has a higher incidence in human populations with an underlying diagnosis involving mental functioning. These diagnoses include: psychiatric conditions like schizophrenia, developmental disorders including autism (psychological disorder characterized by preoccupation with inner thoughts, daydreams, fantasies, delusion and hallucinations) and conditions with mental retardation. These conditions are not characterized by iron deficiency, which supports a psychological component in the cause of pica.

Cultural and religious traditions may also play a role in pica behavior. In some cultures, nonfood substances are believed to have positive health or spiritual effects. Among some African Americans in the south, ingesting a particular kind of white clay is believed to promote health and reduce morning sickness during pregnancy.

### Clinical manifestations and diagnosis

Affected animals have the tendency to lick and to gnaw almost anything which they come into contact with. They seem particularly disposed to eat earth and sand (geophagia), bones (osteophagia), soiled litter and even excreta (coprophagia). Some affected animals lick the walls and floors of the byre (Wooldridge, 1923). Similarly, some animals such as bitch, cat, sow, ewe, goat, cow and buffalo may devour the placenta. This act is called placentophagy. In bitch, it may be due to protein hunger. The expelled fetal membranes should be removed because their ingestion may cause choke, indigestion, diarrhea, toxemia and other digestive disturbances. Mare is an exception since she does not eat placenta. Placentophagy has been ascribed to the behavioral adaptation by the dam to predation on the newborn (Velhankar and Sonawane, 1994).

When first noticed, the animal may be in a good body condition, but soon there is loss of condition. The animal becomes somewhat restless and depressed. The

appetite for normal foods is very capricious. The animals may almost at any time eat the abnormal substances and may also lick the clothes of the attendants, and gnaw at the fixed objects to which they may be attached, such as the manger, partition, etc. Goat and sheep tethered to the trees may start peeling the bark of the trees by nibbling with their teeth. Later, the animal becomes quite thin and wasted and shows various symptoms of indigestion, such as intermittent tympany, irregular bowels and partially suspended rumination. The feces become more or less dry and firm, although occasionally may be diarrheic and offensive in odor. The mucous membranes become pale and the skin becomes harsh and shaggy in appearance. The affected animal progresses towards hide-bound. When phosphorus deficiency is the underlying cause, the affected animals not only have a depraved appetite, but also fail to breed regularly, and their milk production is markedly decreased. In young animals, growth and development are slow and the animal becomes emaciated and fails to reach normal adult size. If untreated, the animal may die from malnutrition and exhaustion, after a varying period that may extend over months. Depraved appetite often precedes osteomalacia in cattle, in which the bones become brittle and easily fractured. Osteophagia may predispose the animals to botulism (Radostists *et al.*, 2007).

As pointed out earlier, the causes of pica are often difficult to identify. Licking surfaces generally means a lack of salt (sodium chloride), phosphorus, fiber, water or minerals. Licking skin is often a manifestation of a lack of salt. Chewing dirt or on partitions and gates can be reflection of a lack of natural fiber in the ration. The lack of fiber always creates an acidosis and the desire to find a "tickle" factor.

Because the eating behaviours of pica are not usually detected or reported in human, it is the complications of the behaviors that bring it to attention. Complications vary, depending on the type of pica. Geophagia has potential side effects that most commonly affect the intestine and bowel. Complications can include: constipation, cramping, pain, obstruction caused by formation of an indigestible mass, perforation from sharp objects like rocks or gravel, and contamination and infection from soil-dwelling parasites. Amylophagia usually involves the consumption of cornstarch and, less frequently, laundry starch. The high caloric content of starch can cause excessive weight gain, while at the same time leading to malnutrition, as starch contributes "empty" calories lacking vitamins and minerals. Amylophagia during pregnancy can mimic gestational diabetes in its presentation and even in its potential harmful effects on the fetus. Pica involving the ingestion of substances

such as lead-based paint or paper containing mercury can cause symptoms of toxic poisoning. Compulsive consumption of even a seemingly harmless substance like ice (pagophagia) can have negative side effects, including decreased absorption of nutrients in the gut (Dugan, 2006).

#### Treatment and control

For treatment, where possible, pasture should be changed. If housed, the affected animal should be moved to another shed. Complete change of environment is often necessary. Deworming should be done if a dewormer has not been given within the past 3 weeks. Then, administer a purgative, followed by alkalies and bitter tonics. The following mixture is particularly serviceable (Wooldridge, 1923):

|  |           |
|--|-----------|
| Carbonate of iron                          | = 120 gms |
| Finely ground bone meal                    | = 500 gms |
| Powdered gentian (Gentiana in vernacular)  | = 140 gms |
| Common salt                                | = 240 gms |
| Powdered fenugreek (Maithee in vernacular) | = 140 gms |

These are mixed, and a heaped tablespoonful is given three times a day. In addition, it is recommended that three tablespoonfuls of powdered charcoal be mixed with the food, which must be generous and nutritious. Provision of a lump of rock salt in the feeding-trough is also useful. Successful results have also been recorded from the hypodermic injection of apomorphine daily for several consecutive days. This drug is however, no longer available. To keep the problem under control, the farmers should be advised to supplement the ration with a balanced mineral-vitamin mixture on regular basis. Regular availability of clean drinking water must be ensured when licking is observed. Hay alongwith phosphorus rich food such as wheat and wheat bran, cottonseed meal, peanut meal etc. should be provided (Udall, 1954).

Treatment of pica in human, as in animals, depends on the cause and type of pica. Conventional medical treatment may be appropriate in certain situations. For example, supplementation with iron-containing vitamins has been shown to subside craving in some iron-deficient patients. Medical complications and health threats, including high lead levels, bowel perforation or intestinal obstruction, will require additional medical management, beyond addressing the underlying issue of pica. Because most cases of pica do not have an obvious medical cause, treatment with counseling, education, and nutritional management is often more successful and more appropriate than treatment with medication. Some therapists specializing in eating disorders may have expertise in treating pica (Dugan, 2006).

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