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Sources of high iron content in manufactured pelleted feeds: a case report

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The analyzed values for iron contents of pelleted feeds are often surprisingly high, exceeding the content calculated on the basis of the assumed iron content of the individual ingredients. A common question asked is how such high iron levels in pelleted feeds can be avoided. In order to investigate potential sources of iron in a pelleted mixed feed, we sampled raw ingredients, processed ingredients, processed mixtures and the final product of Boskos® game pellets. Boskos® game pellets consist of South African browse plants, mainly acacias, harvested during field operations against bush encroachment. This procedure ensures the restoration of the natural South African vegetation on farmland that has deteriorated due to cattle overgrazing (with a subsequent increase of bushveld, due to the absence of browsing animals on farms, up to the point where the farms cannot be used any more). Additionally, Boskos® consists of lucerne, various sources of proteins and carbohydrates, and two mineral/vitamin premixes. Representative samples were taken from the production process, and analyzed for iron content.

Two major sources of iron in the final product could be identified. Iron content was low in lucerne and very low in South African bush (app. 40 mg/kg dry matter [DM]), but increased after mechanical processing (drying/milling). The iron content of the complete food mixture was reduced after it passed a magnet which is a routine instalment in food manufacturing plants. This indicates that metallic abrasion during mechanical processing can be one cause of increased iron content in manufactured feed. The other organic ingredients had various iron contents between 30–270 mg/kg DM, with only one ingredient having particularly high iron levels of 1300–1900 mg/kg DM.

However, iron content was extremely high in the two mineral/vitamin premixes used (5000–7000 mg/kg dry matter), for which the iron content was not specified by their respective providers. These results indicate that,
if iron content is an issue of concern, mineral additions must be chosen with particular care in order to avoid unnecessary iron contamination.

The iron content of the final product was within the range analyzed in other pelleted animal feeds (400–500 mg/kg dry matter). Such products are unlikely to be harmful for species not susceptible to iron storage disease, such as ruminants, white rhinos etc. Species susceptible to iron storage disease, in contrast, such as black rhinos, should probably not receive such feeds on a regular basis; if at all, such products can be used in these species for short time periods, such as transport/translocation, where the direct acceptance of the product is more important than potential long-term effects. Wes Enterprises is currently testing different mineral/vitamin supplements for the production of an iron-controlled version of Boskos®.