

FLUORINE ABSORPTION BY CATTLE FED ROCK PHOSPHATES CONTAINING
VARIOUS CONCENTRATIONS OF ALUMINIUM AND IRON

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Despite the hazards of fluorosis from feeding raw rock phosphate (Rock P) to stock, it is still useful in many short-term situations because it is cheaper and more available than **defluorinated** Rock P. Other widely used P supplements also have problems. Although the fluorine (F) content of superphosphate is lower than raw Rock P, it is of higher biological availability. This also applies to dicalcium and monoammonium phosphate. Monoammonium phosphate has the added disadvantage that it does not supply calcium which may be limiting to stock **grazing** tropical grasses (Blaney, Gartner and Head 1982).

Christmas Island precipitator dust has been used in Australia for many years as a livestock supplement. This is a by-product of the rock crushing process and has a relatively low F content. However, it is no longer available. To fill the gap, fertilizer manufacturers have offered a choice between batches and blends of Rock P, all with higher F contents than Christmas Island precipitator dust. As the availability of F may vary with the source of Rock P, a choice of whether there were suitable replacements should not be made upon total F alone.

We speculated that the absorption of F from Rock P might be influenced by its content of **aluminium** (Al) and possibly iron (Fe) since Al compounds have reduced the retention of F from soluble forms of F by cattle (Hobbs and Merriman 1962). We therefore compared **the absorption** of F by steers from 4 batches of Rock P in mineral balance experiments.

Rock P	%F	%P	%Al	%Fe	%F absorbed (± S.E.)
Christmas Is. precipitator dust	1.78	14.6	4.5	2.7	36.7 ± 1.54
Christmas Is.	1.83	15.5	1.7	1.0	49.8 ± 2.90
Duchess	3.06	13.4	0.5	1.1	47.6 ± 6.25
Nauru	2.38	16.0	0.1	0.1	49.0 ± 5.10

Christmas Island precipitator dust had both the lowest F content and availability, probably because of its higher Al and Fe content, but differences between the other supplements were slight. Based on the total amount of F absorbed from similar quantities of Rock P, the fluorosis hazard would be higher with all batches of Rock P tested compared to the precipitator dust.

In addition, we measured the absorption of F from Nauru Rock P both with and without the addition of 3% Al as Al sulphate. Under our experimental conditions, the Al did not decrease the absorption of F. The form of F in the supplements may be a critical factor.

BLANEY, B.J., GARTNER, R.J.W. and HEAD, T.A. (1982). J. Agric. Sci. Camb. 99: 533.

HOBBS, C.S. and MERRIMAN, G.M. (1962). Tenn. Agr. Sta. Bul. 351.

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