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MINERALS FOR LIVESTOCK—
Why Buy "Shot-Gun" Licks?

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COMMERCIAL stock licks can contain a great variety of minerals, and the labels, as a result, often list an array of ingredients which can appear quite impressive. It is important, therefore, that the farmer should be able to tell which of these ingredients, if any, are of any value to his livestock. In most cases only one or two supplementary minerals are required on a farm, so that if a lick contains a large number of minerals most of these are wasted. For example, in most coastal areas a cobalt supplement is needed by sheep and cattle. The farmer, in this case should buy cobalt and not a compound lick which contains many other things. One does not buy a suite of furniture when all that is required is a chair.

Not only is it necessary to know the constituents which are required by the stock—one should also check on the quantities which are present. Some licks have been described as "phosphatic licks" when they have contained only a little phosphate and a lot of common salt. Considerable quantities of salt are sold at fancy prices in the form of stock licks, so always check the amount of salt which is present before making a purchase. And beware of "tricks" of the type employed by the manufacturer of one lick which was advertised as containing 30 per cent. chloride and 45 per cent. sodium when it would have been much simpler (and more honest) to have stated that the lick contained 75 per cent. common salt (sodium chloride).

In order to make the farmer more discriminating when purchasing or preparing stock licks, the following brief comments have been made concerning ingredients which may be included.

COMMON SALT

Common salt is the basis of most mineral licks. It is used because it may be valuable in its own right, but more often because it is a cheap and convenient vehicle through which to feed the so-called trace elements. From time immemorial, salt has been considered necessary to grazing animals, and many farmers still go to considerable expense and trouble to make it available to their stock.

It is now known that sheep, in particular, will eat large quantities of salt, not necessarily because it is of any value to them, but merely because they like salt, just as kiddies like sweets. Quite a few experiments have been carried out in various parts of Australia to determine if common salt is of any value to sheep. In Table I are recorded the results of an experiment carried out in New South Wales (McClymont and Savage, 1950) which shows clearly that sheep can eat considerable quantities of salt without showing any apparent benefit.

<table>
<thead>
<tr>
<th>Dorset Horn Weaner Rams</th>
<th>Average Initial Weight lb.</th>
<th>Average Final Weight lb.</th>
<th>Average Gain in 307 days lb.</th>
<th>Lick Eaten lb.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>84</td>
<td>166</td>
<td>82</td>
<td>0</td>
</tr>
<tr>
<td>Given Salt Lick</td>
<td>86</td>
<td>168</td>
<td>82</td>
<td>240</td>
</tr>
<tr>
<td>Given Salt plus Ground Limestone</td>
<td>86</td>
<td>165</td>
<td>79</td>
<td>396</td>
</tr>
</tbody>
</table>

On the basis of such results, official recommendations have been against the feeding of salt to sheep. The flocks on the research stations in Western Australia do not receive any salt and there is no reason to suspect that the returns have been decreased in any way because of this. It has been argued that salt stimulates the appetite and increases the digestive efficiency of sheep on harsh dry feed. Possibly this is correct but there is not experimental evidence to justify the feeding of salt to sheep if this is in any way costly or laborious.
At times it is necessary to supply salt to dairy cattle (1 to 2 oz. per head daily) and to pigs (1 lb. in each 200 pounds of grain) but the quantities are relatively small and do not justify the purchase of a large amount of common salt in commercial compound licks. If salt as such is needed, it is cheaper to buy ordinary stock salt and use it according to Departmental recommendations.

**CALCIUM OR “LIME” (Ca)**

Calcium is a major constituent of bone and it also plays an important part in many bodily processes. Many stockmen still believe that additional lime is needed if animals are to develop sound bone and large frames. In Western Australia, however, most of the pastures supply sufficient lime. Leguminous herbage in particular is rich in lime and where sub-clover, trefoil, lucerne and similar plants are available in reasonable quantity there should be no need to fear a lime deficiency in grazing animals.

Cereal grains and cereal hays, in contrast, contain very little calcium. It may be thought, therefore, that calcium supplements would be needed in Eastern Wheatbelt areas where stock have to subsist for many months on a predominantly cereal diet. Fortunately, such does not appear to be the case as no clinical evidence of calcium deficiency has been reported. In fact, sheep from these areas have a reputation for large frames and sound teeth.

Milk fever in cows and hypocalcaemia in sheep occur when the amount of calcium in the blood falls below a critical level. These conditions, however, are not due to a lack of calcium in the diet but to a temporary upset in the mechanism which controls the level of calcium in the blood. As far as we know, the feeding of extra lime will not prevent the occurrence of these diseases.

Calcium deficiency is most likely to be seen in livestock which are kept in a confined area and which receive specialised diets. For example, pigs kept in pens and fed mainly on grain require additional lime (1 per cent. ground limestone in the grain). Laying hens, likewise need plenty of calcium. Where calcium supplements are needed, however, the obvious thing to do is to buy this in the cheapest form, that is, purchase ground limestone or oyster flour and use this as recommended by the Department of Agriculture.

**PHOSPHORUS (P)**

Phosphorus is needed in considerable amounts by growing and lactating animals and if the diet is deficient in this essential the consequences can be serious. Most soils in Western Australia are deficient in available phosphorus and, even when this has been corrected by continued topdressing, the dry mature herbage available over the summer months rarely contains enough phosphorus for the well-being of grazing animals. Experiments which have continued for seven years at the Bramley Research Station have shown conclusively that phosphatic supplements are essential for the maintenance in dairy cows of high production and regular reproduction. The methods of using these supplements will be described in detail in a subsequent Journal article.

If a mineral lick is purchased to supply phosphorus care should be taken to ensure that a worthwhile amount of this element is present. I have before me the analyses of one proprietary lick which contains “Phosphorus (P₂O₅)—1.3 per cent.” This amount is hardly worth a mention; bran for example, contains more phosphorus than this. When needed, buy a straight out phosphatic supplement such as bonemeal (12 per cent. P = 28 per cent. P₂O₅) or ground rock phosphate (17 per cent. P = 39 per cent. P₂O₅) or use the water soluble fraction in superphosphate.

**MAGNESIUM (Mg.)**

This is often listed as an ingredient of mineral licks. Plant material contains about 0.5 per cent. Mg. while there is only about 0.04 per cent. in the bodies of animals. Obviously it is most unlikely that grazing animals will need additional magnesium. Magnesium sulphate or Epsom salts can at times serve a useful purpose but it seems pointless to add magnesium to a mineral lick.

**POTASSIUM (K)**

Plant material is rich in potassium and there is no need to add potash to a mineral lick.
SULPHUR (S)
Elementary sulphur ("flowers of sulphur") has been used in some proprietary licks for many years. Claims are made that this sulphur is of medicinal value and also that it helps in the building up of the sulphur-containing amino acids required for wool growth. There is no evidence, however, that stock on normal rations will benefit from additional sulphur or from sulphates. The dry matter of good pasture should contain about 0.3 per cent. S. It has been shown experimentally that breeding ewes need only 0.1 per cent. S in the dry matter consumed for the efficient production of meat and wool (F. Whiting et al. 1954).

IRON (Fe)
Most of us have heard tales concerning the value of iron tonics, and on the strength of these tales, "tonic" mineral licks are sold at a high price. Normal diets contain plenty of iron and it is most unlikely that stock will benefit from any addition. In the past, licks containing "iron" have appeared to be beneficial but this was because the iron salts contained trace elements which were needed. For example, iron ore (limonite) was found to cure Denmark Wasting Disease but this was because limonite contains cobalt: it was lack of cobalt which caused the disease and not lack of iron.

COPPER (Cu)
Copper deficiency was once a serious problem over large areas of Western Australia and stock licks containing copper can be of great value. Copper, however, is an essential plant nutrient and good pasture cannot be grown on copper-deficient soil. It follows that copper where practicable should be used as a fertiliser where the soil is deficient. If the pasture is healthy this will supply all the copper needed by the animal. In pastoral areas and on coastal country where top-dressing would be uneconomic, it may be necessary to use licks containing copper or to add copper to the drinking water. Here again, if copper is needed it seems preferable to buy bluestone as such and use it in one of the ways recommended by Dr. H. W. Bennetts in the January-February issue of the Journal of Agriculture (Bulletin No. 2227). Denmark Lick also, is a cheap and convenient source of copper for livestock.

COBALT (Co)
Generally, in coastal areas cobalt supplements are essential for sheep and cattle. The farmer must decide just how to supply this cobalt. Full details can be obtained in Departmental Bulletin No. 2172. The required cobalt can be supplied at little cost in the form of commercial cobalt salts, or Denmark Lick. Superphosphate containing cobalt can also be applied to the land—cobalt is not a plant food but, if it is present in the soil, sufficient gets into the plant "by accident" to correct cobalt deficiency.

Boom sprays can be used to apply cobalt salts to the soil along with the insecticide solutions used in the control of red mite or lucerne flea. A dressing of 4-6 oz. of commercial cobalt sulphate or cobalt chloride per acre should ensure an adequate intake of cobalt by the stock for two or three years.

IODINE (I)
In those areas of the world where the soils are deficient in iodine, iodised salt licks have proved of great value. There is no evidence, however, that livestock in Western Australia suffer from lack of iodine. The symptoms seen in iodine deficiency are very characteristic and until these symptoms have been reported and confirmed, there is no point in buying a stock lick because it contains iodine.

MANGANESE (Mn)
Manganese is often listed among the constituents present in stock licks. As far as is known, this is likely to be required only by young chickens on specialised rations. Periodically, reports are received from overseas which suggest that various diseases may result from a lack of manganese. Pending further study, therefore, it would be foolish to dismiss claims that manganese can be beneficial but at present there is little to indicate that additional manganese is needed under field conditions in Western Australia. The requirements of the plant are much greater.
than those of the animal and therefore stock at pasture do not need supplementation.

**ZINC (Zn)**

In many areas, crops and pastures have responded to manurial treatment with zinc. This has given rise to the misconception that zinc may be of value to animals also. Even on zinc-deficient soils, the plants contain more than enough zinc for the grazing animals. In other words, although lack of zinc may limit the growth of pasture and the carrying capacity of the farm, such pasture as does grow will contain ample zinc for livestock.

**GENERAL**

Stock owners in Western Australia are very “mineral conscious.” In an endeavour to correct possible deficiencies, there is a tendency to buy small amounts of a lot of things instead of concentrating on known shortcomings. From the comments which have been made in this article it is apparent that the supplementary feeding of minerals can be restricted to two, or perhaps three, constituents. Of course, much remains to be learnt concerning the mineral requirements of animals and it is possible that new knowledge may result in additions to the list of minerals which are required in stock licks. For the present, however, it seems that supplementary feeding can be simple and straightforward. The advocates of compound or “shot-gun” licks claim that it costs very little to put in “everything” so this is done “just in case.” The extra ingredients must cost something, however, and when compound licks are used there is a tendency to skimp the main essential. To me it seems preferable to determine what is needed in a given district and to concentrate on supplying this in adequate amounts.

**REFERENCES**


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**RESEARCH IN MULGA AREAS**

A programme of pastoral research was commenced this year in the mulga areas. A research officer and a technician now resident in the Lake Way Hotel, purchased by the Government last year to provide accommodation for research and technical staff, will devote the whole of their time to a series of field trials to be carried out in co-operation with pastoralists in the Wiluna and Meekatharra districts.

At the Wiluna end, the Howard Bros., of Albion Downs, have been particularly helpful in providing country, fencing and labour for trials concerning the nutritional value of mulga, and the effect of thinning a stand of mulga which had grown too tall to be of much grazing value.

At Meekatharra, Mr. E. Lee Steere, of Belele Station, will be assisting with trials concerning possible methods of regenerating country which formerly carried a variety of sheep feeds but has become progressively taken over by less desirable species or left to bare windblown surface.

Mr. White, of Yarrabubba, is co-operative with a grazing and management trial on saltbush and bluebush country.

If the trials should be attended by anything like the success achieved with this class of work in the Port Hedland areas, as evidenced by the recent field day at Munda, it will mean a great deal to the pastoral industry.
Applications are now being invited for the two years' vocational course at the Schools of Agriculture commencing in February, 1958.

Applicants must be between the ages of 14 and 17 years and must have passed the Sixth Standard of the Primary School curriculum.

Applications must be made on the prescribed forms obtainable on request from the Education Department, Perth, and must be lodged prior to the 1st November, 1957.

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In addition the Course is extended to include the following subjects:—

- At Narrogin.—Leathercraft, Fruit Drying, Orchard Work and Wheat Growing.
- At Denmark.—Leathercraft.

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Further particulars may be obtained from the Education Department, Perth.

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