

Paper as sheep feed

Scientists are finding all sorts of uses for wastes these days as they battle with the ever-growing problems of waste disposal and resources depletion. Dr Barry Coombe of the CSIRO Division of Plant Industry has recently found that paper can be used in sheep feed.

Looking at the problem theoretically, this isn't surprising. Grass is mostly cellulose. In wood, cellulose is bound to lignin, and sheep can't digest the combination. But when wood is turned into some types of paper, most of the lignin is removed and we're back with flexible cellulose. In practice, there are also questions of acceptability and digestibility to be considered. And some of the bleaches, dyes, and inks that paper is subjected to could be poisonous.

Mrs Anne Briggs of the Division examined the chemistry of a range of paper products. She found that some paper, notably glossy magazine paper, contains large amounts of soluble ash that includes some unidentified and possibly dangerous compounds. Newspapers contain some lead, but



probably not enough to be harmful. Other types seem safe.

Dr Coombe conducted a series of feeding trials with sheep. In one experiment he fed different groups of 7-month-old ewes printed paper from Canberra's Government Printing Office, old newspapers, and a mixture of those two types of paper. The paper was chopped up and put into pellets with urea, molasses, and minerals. He also fed the sheep chaff made from lucerne hay.

The animals refused to eat the newspaper pellets. They did eat the mixed-paper pellets but slowly lost weight. The sheep eating government paper put on some weight over the 7 weeks that their diet was restricted to the pellets and chaff. However, their weight gain was only half that of another group fed lucerne pellets and hay.

Previous research has shown that, in the laboratory, it is possible to obtain weight gains in sheep with protein-free diets; their protein needs are met by the conversion of nitrogen compounds in their feed to protein by microorganisms in their fore-stomachs. Dr Coombe's results seem to show, however, that when sheep eat paper their microorganisms do not convert enough

nitrogen-rich urea to give them a weight gain.

Nevertheless they managed to put on weight when the only protein in their diet was the small amount in lucerne chaff and, apart from this chaff, their only feed was the government-paper pellets. Paper clearly has potential as an energy source for sheep.

Dr Coombe was not surprised that the sheep didn't take to newsprint, because it contains a high proportion of indigestible lignin. However, many recycling processes for paper involve the removal of lignin, so the products that emerge when old newspapers go through these processes could probably be used in the feed.

Half the solid refuse that has to be disposed of in Australia is waste paper; it is a cheap and plentiful commodity. However, the market for prepared sheep feeds is at present very small in Australia, and whether such waste can be used economically as sheep feed remains to be seen.

The use of waste paper as a feedstuff for ruminants.
J.B. Coombe and Anne L. Briggs. *Australian Journal of Experimental Agriculture and Animal Husbandry*, 1974, 14, 292-301.