



THE CUTTING EDGE OF NUTRITION

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New Concept?

Methods of disseminating vital information to Ranchers **SUCK**. Take, for example, the concept of Degradable/Escape Proteins. Most of us had heard of it prior to attending the School. (*The terminology may have been "Bypass" rather than Escape*). Few of us, however, were putting the concept to proper use. For many, it was an entirely **new concept**. The feed salesman hadn't even mentioned it. "You want 'all natural' protein? You get 'all natural' protein. You don't want urea? You don't get urea."

It is appalling to think about the megadollars wasted by Ranchers purchasing supplements containing ingredients that did not provide the right kind and amount of protein. It is even more appalling now in the face of a sorry market. Why weren't the Ranchers told that oil-seed meals are not interchangeable? Was it so that feed companies could least cost a **guaranteed protein** content by switching from one meal to another? At times, the cheapest meal is actually the most expensive.

The Degradable/Escape protein principle is an **old concept**. It all was summarized in a book published back in Feb. of 1982¹. The bulk of the research studies used in the book's compilation was published in the 60s and 70s.

Fat to Lean \bar{w} Protein

During a break at a recent School, the subject of marketing fat lambs came up. With current limited slaughter capacity in the U.S., finished lambs are waiting their turn. They are becoming fatter, moving toward too fat and a lower quality grade. I told the story about fat lambs in Scotland that gained in lean tissue mass while consuming a low energy diet. The key was supplemental Escape Pro-

¹ Ørskov, E.R. 1982. Protein Nutrition in Ruminants. Academic Press Inc. 111 5th Ave. NY, NY 10003.

tein. The study is reviewed here - not so much for the fat animal problem but rather for the biological impact of the Degradable/Escape Protein concept.

Slimming Diet

Overfat lambs, weighing approximately 100 lb, were divided into two groups and fed barley straw ad libitum with or without 0.183 lb of fish-meal daily². A sampling of lambs were slaughtered after 14, 28 and 42 days from the start of the dietary treatment. The experiment was repeated with a second set of lambs. Live weight performance is shown below. In the first experiment, the unsupplemented

Live Wt Changes (lb/14 d Period)		
	Straw Only	Straw + Fish-meal
Exp 1		
0 to 14 d	-3.09	+0.40
14 to 28 d	-2.96	+1.36
28 to 42 d	-5.90	-2.01
Exp 2*		
0 to 14 d	-6.42	-3.73
14 to 28 d	-3.73	0
28 to 42 d	-7.25	-1.64

*Straw limit fed for first days

lambs lost weight throughout the 42 day study. Conversely, the lambs fed fish-meal actually gained weight for the first 28 days even though this diet was also submaintenance. The researchers attempted to minimize straw waste early in the second experiment. Consequently, the lambs lost weight during the first 14 day period.

Carcass data are given in the following table. Those lambs whose diet was not supplemented lost considerable carcass yield, while the fish-meal fed lambs held their own. The same can be said for the saleable lean portion of the carcass. Energy mobilized from the loss of fat tissue was converted to muscle tissue. Remember NE Δ ?

² Vipond, J.E., M.E. King, E.R. Ørskov & G.Z. Wetherill. 1989. Effects of Fish-meal Supplementation on Performance of Overfat Lambs Fed on Barley Straw to Reduce Carcass Fatness. Anim. Prod. 48:131.

Carcass Characteristics		
	Straw Only	Straw + Fish-meal
Carcass wt (lb)		
0 to 14 d	48.1	49.4
14 to 28 d	45.0	48.3
28 to 42 d	40.3	47.6
Saleable Lean (lb)		
0 to 14 d	26.8	27.9
14 to 28 d	24.8	27.7
28 to 42 d	22.1	27.2

The net daily intestinal protein requirement for these lambs was 2.665×10^{-3} lb/wt⁷⁵. *The Brits state requirements as net protein delivered to the intestine, while we add the biological inefficiencies to this for requirements. Our requirements appear much higher.* The only source of protein for the unsupplemented lambs was Microbial. With protein from the straw together with NH₃ from the **urea cycle** (remember?), intestinal protein was 0.594×10^{-3} , well below that required for maintenance. Microbial Protein produced in the rumens of the supplemented lambs amounted to 0.937×10^{-3} , also submaintenance. Fish-meal contained 18% Degradable and 42% Escape Protein. Thus the supplemented sheep received an additional supply of protein from Escape Protein in the amount of 1.752×10^{-3} lb. This brought the total intestinal protein to 2.689×10^{-3} lb/wt⁷⁵, comfortably in the range for maintenance.

The proper application of the Degradable/Escape protein concept has a tremendous biological impact and probably, a greater economic impact.

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