



Wool can feed cats, dogs, people

When AgResearch scientists started thinking outside the square on uses for wool, feeding it to cats did not feature at the top of the list of options. However, thanks to a growing understanding of what makes wool wool and some smart extraction processes, the world's domestic felines might soon find it is part of their daily diet. **Richard Rennie** spoke to Dr Santanu Deb-Choudhury about a new opportunity for turning the fibre into food.

NEW Zealand scientists' understanding of wool and its potential uses is rapidly moving beyond the applications afforded by its durability, strength and its ability to absorb liquids. Instead, researchers are stepping inside the fibre to better understand the compounds that create it and find uses for those building blocks.

Scientists at AgResearch Lincoln have recently released a study on their work to identify, extract and feed wool-derived proteins to domestic cats.

Already, the results are generating interest from international food manufacturers.

"We have had a good understanding of wool's structure and the associations that give the fibre the strength it has but we had never thought about using wool as a food source," Dr Santanu Deb-Choudhury said.

"But when you think about it,

wool is actually 90-95% protein and offers that potential to be a good food source.

"The inherent nature of wool, though, is that it is very resilient and not broken down easily and that was the challenge, to extract wool proteins in a way that could be scaled up cost-effectively."

Scientists have worked on a relatively simple acid extraction process to unlock the fibre's proteins through a process known as acid hydrolysis.

Optimising the length of

exposure to the acid was critical but the team hit on a process that also maximises the yield from the wool feedstock, returning an 85-95% extraction rate on the wool proteins.

The extracted proteins also contain traces of deconstructed wool fibre, known by the scientists to also encourage positive gut microbe growth.

Researchers decided to determine if the proteins would have any useful value in cats' diets and ran a trial comparing cats on a usual diet with cats on one supplemented with wool proteins.

To determine the impact of the proteins on feline diets scientists had the unenviable task of analysing cat faeces, measuring microbial bacteria levels to determine its effect on them.

"And we found the microbes behaved well in the cats' gut compared to the other fibre-based compounds used by manufacturers of pet food."

Typically, the fibre compounds used now are plant based but manufacturers have been seeking out animal-based compounds to feed carnivorous pets like cats and dogs.

So far, the option to have presented itself is a cartilage-sourced compound.

"There is definitely a gap there for such a product in the processing market."

Importantly, the wool proteins have no effect on palatability with cats devouring the meals containing it.

Deb-Choudhury is also buoyed by the benefits the cats enjoyed from increased cysteine (sulphur-

rich amino acid) digestibility compared to conventional ingredients.

Cysteine is an amino acid essential for sheep to produce wool and when digested plays a crucial role for inducing healthier hair and coat growth in pets, a valuable potential selling point for any additive used in the

domestic pet food market.

"The next step for us is to trial the proteins in dogs and we suspect we will see the same benefits for them.

"If it proves positive we would then want to carry out human trials."

The human benefits fall not so much towards healthier hair but for the role it plays as a source of sulfur in human metabolism.

"It may prove to be an ingredient that could be used as a dietary supplement additive."

Deb-Choudhury says scientists are excited by other compounds they might be able to extract from wool, given it is a very rich protein source.

"In the future we can see it as a protein source to generate bio-actives for the nutraceutical or pharmacy industry.

"These compounds may also prove to have an effect on physiology, including reducing high blood pressure or managing diabetes."

“ If it proves positive we would then want to carry out human trials. ”



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Dr Santanu Deb- Choudhury AgResearch



HIGH-TECH DINNER:
AgResearch scientists including Dr Santanu Deb-Choudhury are extracting proteins from wool to use in pet and human diets and provide health benefits.