

PRELIMINARY RESEARCH TO EMPLOY A MUSHROOM CULTIVATION BYPRODUCT
IN RABBIT FEEDING.*

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I N T R O D U C T I O N

The straw commonly used as a substrate for cultivation of edible mushrooms is a byproduct that seems worthwhile to be studied as feed for animals.

The byproduct of the cultivation of Pleurotus ostreatus (Compost) appears as a whitish, friable, good smelling mass. The Compost is easily conserved after drying and it is possible to obtain a pellet of good quality by it without any additive or previous treatment. According to literature (1,2,3,4,5), Pleurotus is able to utilize several substrates rich in cellulose and lignine like straw, hay, leaves and saw dust and it is able to fixe and metabolize the atmospheric nitrogen (6,7). A part this last point, a useful ballast effect together with a better digestibility of fiber could then be assumed when Compost is supplied to rabbit.

Previously to any attempt to verify this hypothesis a trial was planned to control if Compost is palatable to rabbits, if it does involves any pathological effect and if organoleptic characters of meat are in same way affected.

M A T E R I A L S A N D M E T H O D S

New Zealand white groups of 3 males and 3 females, weighing about g 1100, were utilized. The control groups received wheat straw or medium quality alfa-alfa hay ad libitum; wheat straw mushroom substrate Compost ad libitum was the experimental treatment.

A commercial pelleted mash was also given to the animals and it was rationed to 75% of normal daily consumption in order to make possible an appreciable roughage consumption. A fourth treatment received

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pellet only at 50% of normal daily consumption to verify the limits within which the rabbit is able to compensate the reduced amount of pelleted food with a higher consumption of roughage.

The pelleted mash had a high protein (22.7%) and low fiber (12%) content in account of that the ad libitum feedstuffs are abounding of crude fiber.

Compost was previously dried until reaching the humidity content of the control roughages. The chemical composition of the studied feedstuffs are compared in tab.1.

Tab.1 CHEMICAL COMPOSITION OF FEEDSTUFFS (d.m.)

	hay	straw	compost	pellet
crude prot.	17.6	4.6	8.3	22.7
lipids	2.4	1.1	1.2	3.4
crude fiber	31.1	34.2	24.1	12.0
N-free ext.	40.7	44.9	46.8	51.2
ash	8.2	15.3	19.5	10.7
C.W.C.		73.9	70.6	
A.D.F.		51.2	51.9	
A.D.L.		12.3	12.8	

The experimental treatments were twice replicated. Growth and food consumption were weekly registered. All the animals were subjected to clinical control.

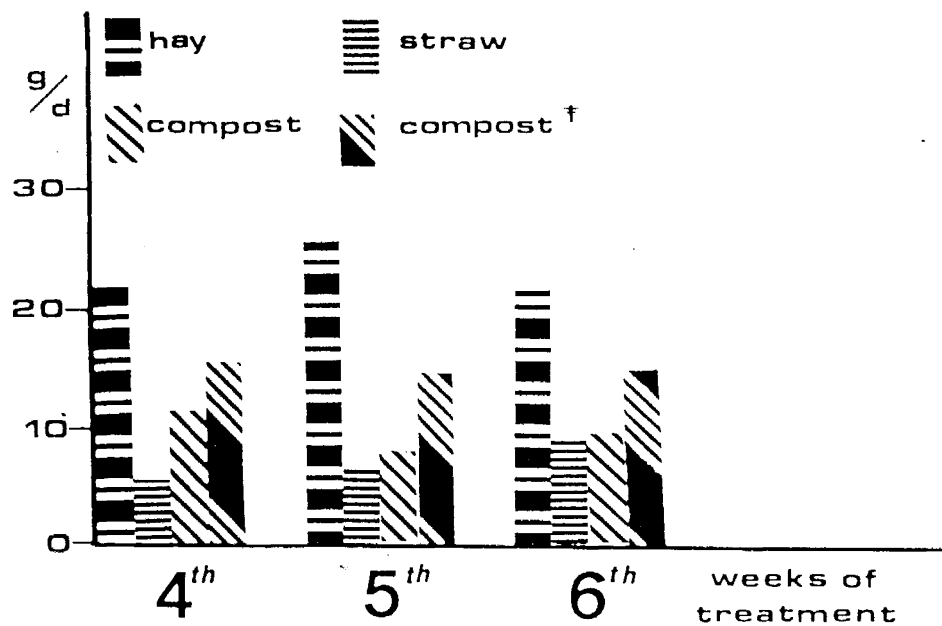
After six weeks of treatment the rabbits were slaughtered and they were singularly subjected to autopsy. Specimens of thymus, thyroid, suprarenal glands, prostatic gland, testicles or ovaria, liver, lungs and small intestine were collected for histological analysis.

Carcasses were conserved in refrigerator for a week and then roasted.

Samples of cooked meat were tasted for quality by a panel of 6 referees and flavour and tenderness were judged by a ten point scale.

R E S U L T S A N D D I S C U S S I O N

Feeding behaviour towards Compost appeared quite normal. Roughage consumption of the three last experimental weeks is reported in fig.1



† Pellet at 50% of daily normal consumption

Fig.1. Daily pro capite roughage consumption in the last weeks of treatment.

Compost consumption was constantly though not significantly higher in comparison to straw. The 50% restricted pellet supply induced the rabbit to significantly increase Compost consumption to about twice straw consumption at the 75% level of pellet administration ($P < 0.01$).

Anyway straw or Compost palatability never reached a level to be compared to hay palatability. The comparison in terms of palatability is justified by the fact that to compensate pellet restriction the rabbits should have been feed themselves with more straw or Compost than hay. As regarding palatability, Compost can thus be considered comparable to straw but not to hay.

During the experimental period nor treated rabbits nor controls exhibited any clinically evident pathology and the biopsy of the specimens collected by the different tissues allowed to exclude any disturbance at histological level.

Panel test for quality (fig.2) showed no significant difference for toughness and a significant difference for taste in favour of Compost comparatively to hay. The same result was observed when Compost was fed to lambs (8).

Meat of rabbits which received Compost was better also than the one from rabbits receiving straw and more when more Compost was ingested

Tab.2 MEAT QUALITY ACCORDING TO TREATMENTS

	hay		straw		compost		compost*	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
toughness	6.3	1.6	6.2	1.6	6.2	1.5	6.5	1.1
taste	5.4 ^b	1.2	5.9 ^{ab}	1.2	6.1 ^a	0.9	6.6 ^a	0.9

* Pellet at 50% of normal daily consumption.

Means with different superscript letters differ significantly ($P < 0.05$).

but the difference did not reached the level of statistical significance.

In conclusion palatability of Compost results similar, if not better, than the one of straw, but not comparable with hay palatability. Animals health looks not impaired.

Compost is thus a byproduct of mushroom cultivation which can replace straw as a component of rabbit mashes without inducing health troubles and possibly inducing an improvement of meat taste quality.

S U M M A R Y

N.Z.w. rabbits were fed ad libitum for six weeks a mushroom (Pleurotus ostreatus) cultivation straw substrate (Compost) together with a restricted pelleted mash diet.

Palatability of Compost was slightly better than straw but not as good as hay. No disturbance of animals health was clinically or histologically detected. Compost ingestion did not affected meat toughness and improved meat taste.

R I A S S U N T O

Conigli bianchi di Nuova Zelanda furono alimentati ad libitum con un sottoprodotto (Compost) costituito da paglia utilizzata per la coltivazione di un fungo edule (Pleurotus ostreatus). Faceva parte della dieta anche un mangime integrato pellettato, razionato a livelli inferiori ai normali consumi.

L'appetibilità del Compost fu leggermente superiore a quella della paglia ma non paragonabile a quella del fieno. All'ispezione clinica

e all'esame istologico non furono rilevati fatti patologici. Le caratteristiche organolettiche delle carni degli animali che ricevevano Compost furono comparabili a quelle dei soggetti di controllo per quanto riguarda la consistenza e migliori per quanto riguarda il sapore.

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