



THE EFFECT OF DIFFERENT DIETARY BEE POLLEN CONSUMPTION ON GROWTH INTENSITY AND BLOOD PARAMETERS OF RATS: A LABORATORY STUDY



**Gálik, B., Bíro, D., Šimko, M., Juráček, M.,
Capcarová, M., Kolesárová, A., Rolinec, M.,
Toman, R., Kanka, T.**

DEPARTMENT OF ANIMAL NUTRITION

Branislav.Galik@uniag.sk

The aim of the study: was to analyse the effect of different rapeseed bee pollen daily intakes on the growth and biochemical indicators in male and female rats.



MATERIAL AND METHODS

A total 40 clinically and healthy male and female rats (Wistar) into 4 groups (5+5 per each):

C: control (basal diet: complete feed mixture)

T1: basal diet + **0.3 %** of bee pollen in feed

T2: basal diet + **0.5 %** of bee pollen in feed

T3: basal diet + **0.75 %** of bee pollen in feed

Age of rats: 40 days, experiment lasted 90 days.



MATERIAL AND METHODS

Experiment was realized in accredited laboratory
(SK PC 50004) of the FAFR, SUA in Nitra.

During the trial: individual body weight analysis,
feed intake and feed conversion ratio.
At the end: blood serum energy and protein profile.

Feed and drinking water: *ad libitum*
 $t = 20\text{-}24^{\circ}\text{C}$, humidity $55 \pm 10\%$, 12h/12 h light/dark



MATERIAL AND METHODS

Table 1. Nutrient composition of the complete diet and bee pollen.

	DM	CP	CF	F	OM	Ca	P
	g · kg ⁻¹ of dry matter						
CD	914.3	233.9	27.3	26.5	933.2	12.1	5.5
Bee pollen	856.3	190.9	29.5	13.4	429.2	1.8	5.3

CD - complete diet; DM - dry matter; CP - crude protein; CF - crude fat; F - crude fibre; OM - organic matter; Ca - calcium; P - phosphorus





Results

Table 2. Body weight development of rats (mean \pm S.D.).

Group	Male (n = 5)		Female (n = 5)	
	BW ¹ kg	BW ² kg	BW ¹ kg	BW ² kg
C	161 \pm 13.42	371 \pm 11.40	122 \pm 4.47	247 \pm 15.65
T1	158 \pm 8.37	368 \pm 25.15	118 \pm 8.37	244 \pm 14.48
T2	179 \pm 11.40	381 \pm 19.50	138 \pm 12.72	238 \pm 19.24
T3	158 \pm 17.35	388 \pm 52.52	140 \pm 12.75	388 \pm 52.52

BW¹ - body weight at the beginning of experiment (40-day-old rats); BW² - body weight at the end of experiment (130-day-old rats); C - control group; T1 - group with 0.3% of bee pollen in diet; T2 - group with 0.5% of bee pollen in diet; T3 - group with 0.75% of bee pollen in diet.



Results

Table 3. Body weight gain and feed conversion ratio of rats (mean \pm S.D.).

Group	BW ¹	BW ²	BW ¹	BW ²
	g Male (n = 5)		g Female (n = 5)	
C	0.211 \pm 14.32	6.11 \pm 0.31	0.125 \pm 12.25 ^{ab}	6.82 \pm 0.59 ^{ab}
T1	0.190 \pm 25.14	6.14 \pm 0.52	0.126 \pm 8.22	6.60 \pm 0.50
T2	0.202 \pm 10.37	6.40 \pm 0.40	0.99 \pm 9.12 ^a	8.27 \pm 0.70 ^a
T3	0.231 \pm 22.73	5.54 \pm 0.62	0.248 \pm 55.30 ^b	7.77 \pm 0.93 ^b

BWG - body weight gain; FCR - feed conversion ratio; C - control group; T1 - group with 0.3% of bee pollen in diet; T2 - group with 0.5% of bee pollen in diet; T3 - group with 0.75% of bee pollen in diet. Values with identical superscript are significantly different at the level of 0.05.

Results

Table 4. Energy and protein blood profile of male and female rats fed a particular diet (mean \pm S.D.).

Group	Male (n = 5)			
	C	T1	T2	T3
TRG (mmol·l ⁻¹)	1.24 \pm 0.21	0.89 \pm 1.23	1.43 \pm 0.20	0.72 \pm 0.08
CHOL (mmol·l ⁻¹)	1.29 \pm 0.18 ^{ab}	1.36 \pm 0.19	1.64 \pm 0.14 ^a	1.80 \pm 0.23 ^b
GLU (mmol·l ⁻¹)	8.36 \pm 0.21	9.52 \pm 1.14	8.14 \pm 1.20	7.28 \pm 0.85
TP (g·l ⁻¹)	79.18 \pm 1.81 ^a	72.81 \pm 4.20 ^a	81.20 \pm 3.86	79.63 \pm 4.18
TC (mmol·l ⁻¹)	2.28 \pm 0.32	2.32 \pm 0.26	0.50 \pm 0.03	2.39 \pm 0.26
UREA (mmol·l ⁻¹)	8.54 \pm 0.50	8.46 \pm 1.02	8.76 \pm 0.67	8.08 \pm 1.07
Female (n = 5)				
TRG (mmol·l ⁻¹)	1.40 \pm 0.23 ^{ab}	1.05 \pm 0.06 ^a	1.18 \pm 0.11	1.39 \pm 0.23 ^b
CHOL (mmol·l ⁻¹)	1.18 \pm 0.09 ^{ab}	1.50 \pm 0.23 ^a	1.24 \pm 0.09	1.77 \pm 0.21 ^b
GLU (mmol·l ⁻¹)	7.86 \pm 0.86	8.08 \pm 0.78	9.0 \pm 1.45	7.5 \pm 0.94
TP (g·l ⁻¹)	72.48 \pm 3.63 ^a	71.64 \pm 4.12	78.62 \pm 6.16	83.49 \pm 2.09 ^a
TC (mmol·l ⁻¹)	0.46 \pm 0.05	1.33 \pm 0.07	2.79 \pm 0.44	0.87 \pm 0.09
UREA (mmol·l ⁻¹)	7.96 \pm 1.12 ^a	9.46 \pm 0.31 ^a	7.76 \pm 0.86	8.32 \pm 0.86 T

RG – triglycerides; CHOL – cholesterol; GLU – glucose; TP - total protein; TC - total creatinine. Values with identical superscript are significantly different at the level of 0.05.

Conclusions

1. Rapeseed bee pollen in concentration of **0.75%** positively affected the **body weight gain and feed conversion ratio** ($P > 0.05$) in male rats.
2. Rapeseed bee pollen in concentration **0.75%** positively affected the **body gain** ($P < 0.05$), however **with higher feed consumption** in females.
3. In biochemical indicators, a **tendency of lower TRG and higher CHOL concentrations in males were found**.
4. In biochemical indicators, **significant differences in TRG and CHOL concentrations in females** were found.
5. Rapeseed bee pollen may be used as an animal feed additive for positive effect on the body weight gain and nutrients utilisation.



Thank You for attention!
Branislav.Galik@uniag.sk