

Action B4. Evaluating the Produced Feed for Pigs and Poultry Husbandry
Deliverable B4.1. Complete Chemical analysis of the produced feed, through the pigs and poultry husbandry perspective



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Annex Data

Action	B4 Evaluating the Produced Feed for Pigs and Poultry Husbandry
Partner:	AUA
Deliverable :	B4.1 Complete chemical analysis of the produced feed, through the pigs and poultry husbandry perspective

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1. ACTION B.4.: Evaluating the Produced Feed for Pigs and Poultry Husbandry

Activity B.4.1.: Analysis of produced feed

Deliverable 1. Complete chemical analysis of the produced feed, through the pigs and poultry husbandry perspective

B.4.1.1. Analysis of the feed from the first initial operational period

Table 1. Chemical analyses results of the samples dried at different temperatures

Date	Sample code	T ¹ °C	DM ² %	Ash %	CP ³ %	EE ⁴ %	CF ⁵ %	Insoluble Protein % CP	Soluble Protein % CP	NPN ⁶ % of SP ⁷	True Protein % of SP
08/12/17	35°C	35	94.99	6.48	20.51	23.50	5.09				
	45°C	45	92.43	5.21	17.70	20.51	3.72				
	55°C	55	91.81	5.00	16.61	20.16	3.86				
	65°C	65	92.19	5.10	17.02	21.40	3.75				
30/03/18 Mean value	2_35_A	35	91.00	5.25	27.37	23.57	2.14	12.60	15.56	13.96	1.50
	2_35_B										
	2_35_C										
	2_45_A	45	85.41	4.91	24.84	22.58	1.64	10.16	14.05	13.35	0.70
	2_45_B										
	2_45_C										
	2_55_A	55	94.20	5.27	26.31	23.53	2.43	13.70	12.71	11.51	1.20
	2_55_B										
	2_55_C										
	2_65_A	65	94.90	5.24	25.92	24.51	2.09	12.46	13.22	11.36	1.86
	2_65_B										
	2_65_C										
23/07/18 Mean value	1(4/6)_A_45	45	92.74	10.71	23.46	22.05	8.10	7.35	16.01	15.87	0.14
	1(4/6)_B_45										
	1(4/6)_C_45										
	1(4/6)_A_55	55	91.60	8.38	18.79	20.51	4.06	6.64	12.49	12.30	0.19
	1(4/6)_B_55										
	1(4/6)_C_55										

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Date	Sample code	T ¹ °C	DM ² %	Ash %	CP ³ %	EE ⁴ %	CF ⁵ %	Insoluble Protein % CP	Soluble Protein % CP	NPN ⁶ % of SP ⁷	True Protein % of SP
	1(4/6)_A_65										
	1(4/6)_B_65	65	90.78	7.84	20.70	16.17	4.43	8.00	12.65	12.62	0.03
	1(4/6)_C_65										
	2(5/6)_A_45										
	2(5/6)_B_45	45	91.36	5.47	18.70	32.16	4.07	7.09	11.59	11.26	0.33
	2(5/6)_C_45										
	2(5/6)_A_55										
	2(5/6)_B_55	55	91.78	5.49	17.67	32.37	4.20	7.58	10.02	9.77	0.25
	2(5/6)_C_55										
	2(5/6)_A_65										
	2(5/6)_B_65	65	90.13	4.94	16.91	18.45	4.07	7.31	9.76	9.25	0.51
	2(5/6)_C_65										

¹T = Temperature

²DM = dry matter

³CP = crude protein (N × 6.25)

⁴EE = ether extracts (fats etc.)

⁵CF = crude fibre (cellulose, hemicelluloses ..)

⁶NPN = non protein nitrogen

⁷SP = soluble protein

Insoluble + Soluble Protein = Crude Protein

Non Protein nitrogen + True Protein = Soluble Protein

From the above results, despite their variability, it seems that the drying temperature has no effect on the samples chemical composition. The observed variability among the samples in their chemical composition is rather expected since there is variability in the raw (wet) material. If the total amount of each batch will be grinded and mixed properly, then the outcome will be homogeneous with minimum variability.

Table 2. The carbohydrates' (fructose, glucose, sucrose, maltose and starch) content of the samples dried at different temperatures (35 °C, 45 °C, 55 °C, 65 °C)

CARBOHYDRATE %	35 °C 2_35_A	45 °C 2_45_A	55 °C 2_55_A	65 °C 2_65_A
Fructose	<0.1	0.1	2.2	1.3
Glucose	2.4	3.1	1.5	0.5
Sucrose	0.2	0.2	<0.1	0.6
Maltose	<0.1	<0.1	1.8	0.5
Starch	41.7	26.8	23.1	8.7

From the results of table 2, it can be seen that there is no great variability among the four samples as the individual carbohydrates content is concerned. The insignificant differences that exist among them are due to the same reasons explained earlier on for the samples' chemical composition.

Table 3a. Chemical analysis results of the sample of the **final product**, used for the 1st trial in poultry and pigs, according to Weende procedure

SAMPLE CODE	DRY MATTER %	ASH %	CRUDE PROTEIN %	ETHER EXTRACT %	CRUDE FIBER %
FINAL PRODUCT	89.56	5.49	22.46	21.76	3.92

Table 3b. Solubility analyses of feed samples used in poultry and pig trials

Sample code	CP %	Insoluble Protein % CP	Soluble Protein % CP	NPN % of SP	True Protein % of SP
Poultry Control starter	22.82	17.38	5.44	2.50	2.90
Poultry Control Treatment	22.69	16.75	5.93	3.72	2.21
Poultry Grower starter	21.98	16.68	5.30	2.78	2.51
Poultry Grower Treatment	21.02	15.30	5.72	3.58	2.14
Poultry Finisher starter	18.88	14.92	3.95	2.20	1.75
Poultry Finisher Treatment	18.67	13.44	5.22	3.27	1.95
Pig Control	15.32	11.93	3.39	1.89	2.99
Pig DFR Treatment	14.78	10.66	4.12	2.32	1.80

DFR= dried food residues

CP = crude protein ($N \times 6.25$)

NPN = non protein nitrogen

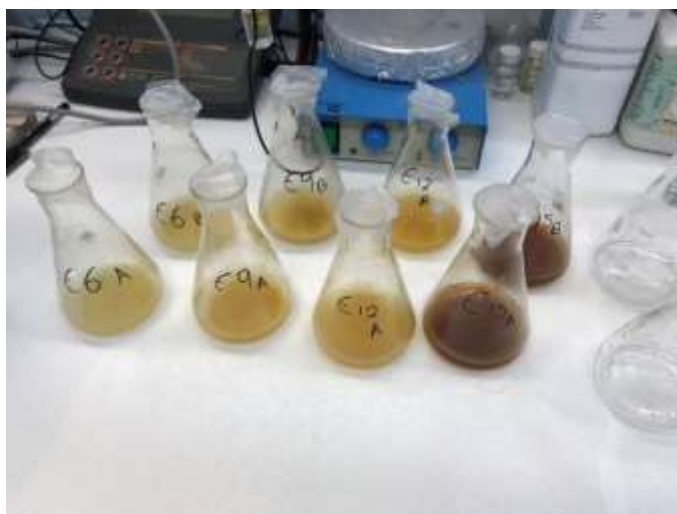
SP = soluble protein

Insoluble + Soluble Protein = Crude Protein

Non Protein nitrogen + True Protein = Soluble Protein



Picture 1. Samples obtained at different temperatures (35°C, 45°C, 55°C, 65°C)



Picture 2. Nitrogen solubility determination in the samples

B.4.1.2. Analysis of the feed with no meat content

A material without meat was used for the two second experiments for broilers and pigs. Crude protein and ether extract were significantly lower in this material, while crude fibre was more than two times from the respective value of the material used in the previous trials.

B.4.1.3. Analysis of sterilized and non-sterilized materials

Table 4. Chemical analysis results of sterilized and non-sterilized samples

SAMPLE CODE	DRY MATTER %	ASH %	CRUDE PROTEIN %	ETHER EXTRACT %	CRUDE FIBRE %
1(2)_(3/8)_3	90.36	6.16	20.58	22.27	3.16
1(2)_(3/8)_3_ST	86.99	5.75	20.25	21.46	3.22
2(2)_(25/9)_4	89.16	6.00	20.65	22.40	2.93
2(2)_(25/9)_4_ST	85.94	5.95	20.25	20.81	2.96
3(2)_(12/10)_5	83.93	6.33	21.07	22.85	3.22
3(2)_(12/10)_5_ST	86.86	6.17	20.86	21.85	3.40
5(2)_(16/10)_8_OR	86.31	4.86	9.78	4.86	9.34
5(2)_(16/10)_8_OR_ST	89.33	4.92	9.32	3.54	9.60

ST = sterilized

Similar values arise from the analysis of the sterilized material for the 2nd poultry trial.

B.4.1.4 Analysis of material from supermarkets with vegetable waste

Table 5. Chemical analysis of supermarkets' vegetable waste

SAMPLE CODE	DRY MATTER %	ASH %	CRUDE PROTEIN %	ETHER EXTRACT %	CRUDE FIBRE %
VEGETABLE WASTE (from supermarkets)	92.02	13.18	16.88	4.25	19.01