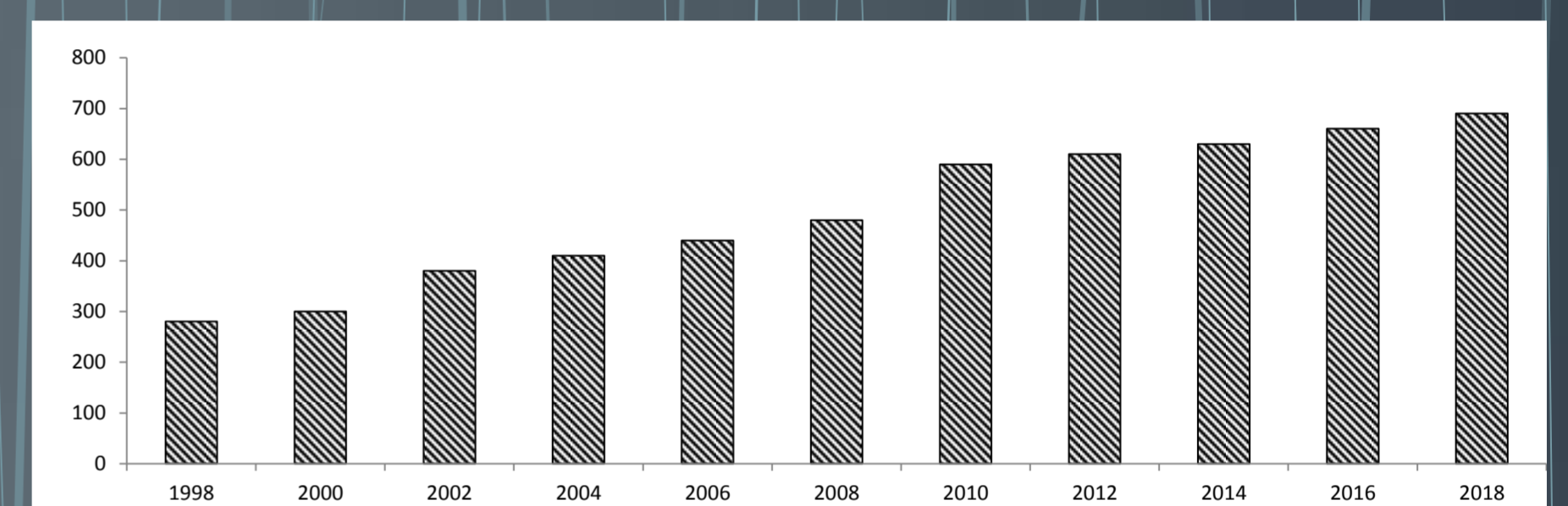
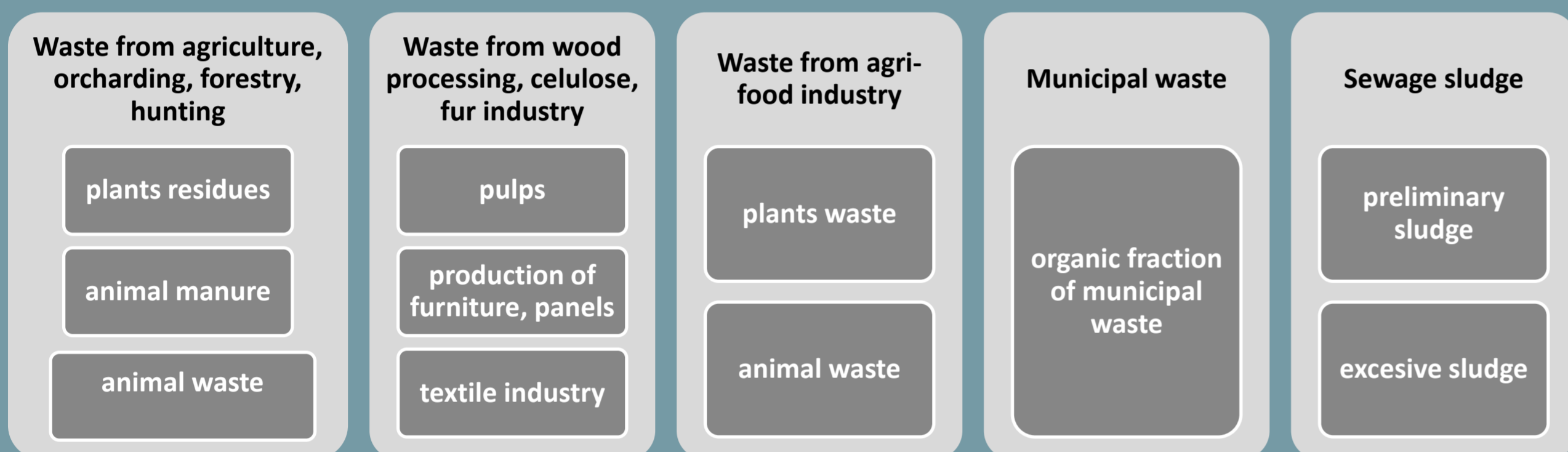


METHANE FERMENTATION PROCESS FOR UTILIZATION OF ORGANIC WASTE: BIOGAS-PROFITABILITY STUDY FOR CHOSEN SUBSTRATES

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INTRODUCTION

Due to the negative impact of conventional energy on the environment as well as running out of fossil fuels, more and more importance is put on the development of renewable energy. Since earliest times biomass was used by humans as a basic source of energy. In many parts of the world, including Poland, methane fermentation process is presently seen as the prospective source of renewable energy and very good way for organic waste utilization. Among a number of types of waste, such as sewage sludge, municipal waste, food industry waste and agricultural waste are most important for using as substrate in methane fermentation process.



Increase of waste production

OBJECTIVE

The aim of the study was to evaluate biogas-profitability of dairy sewage sludge and waste after fruit processing. The study included also the quality of biogas obtained in methane fermentation process of these waste.

MATERIAL AND METHODS

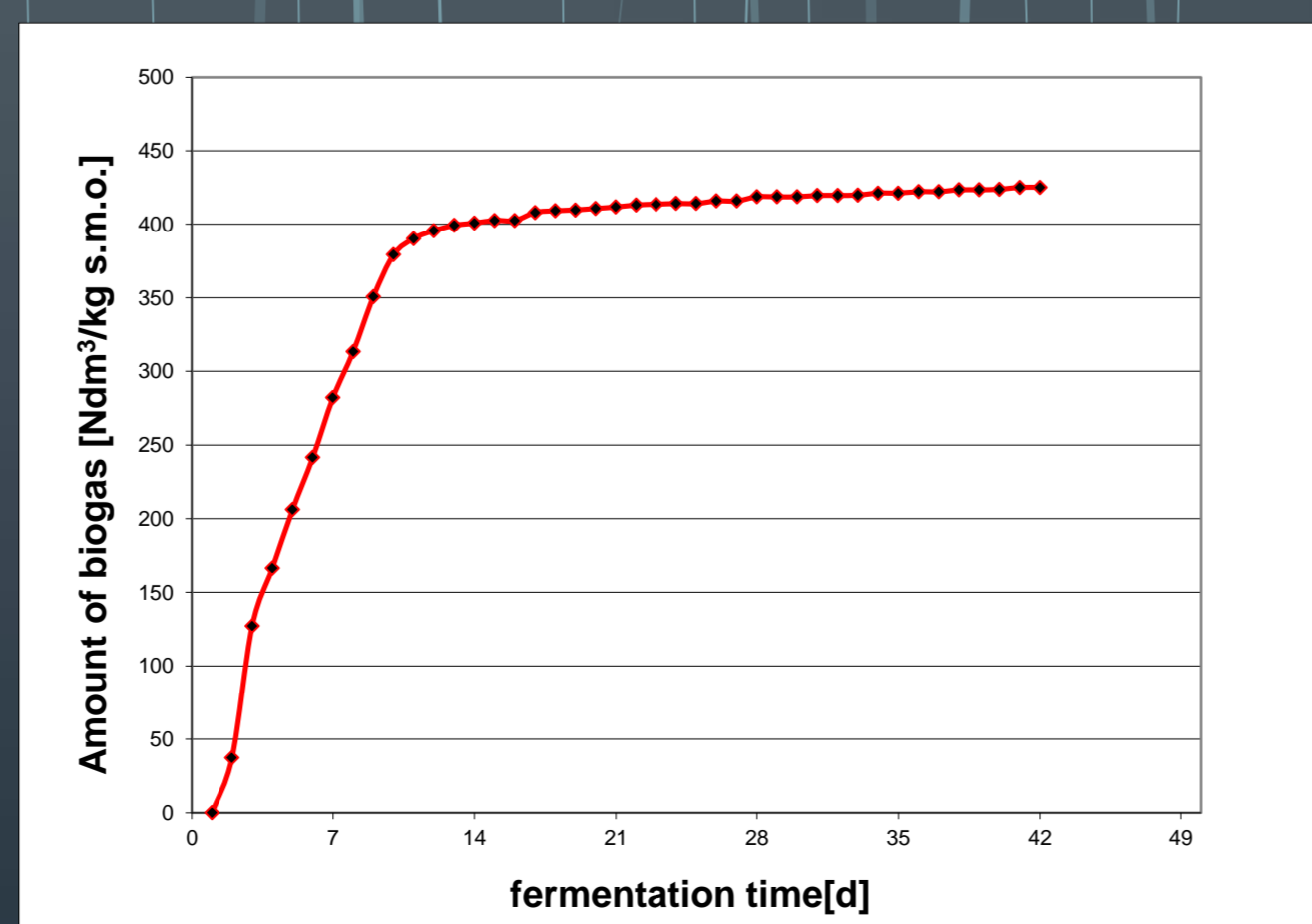
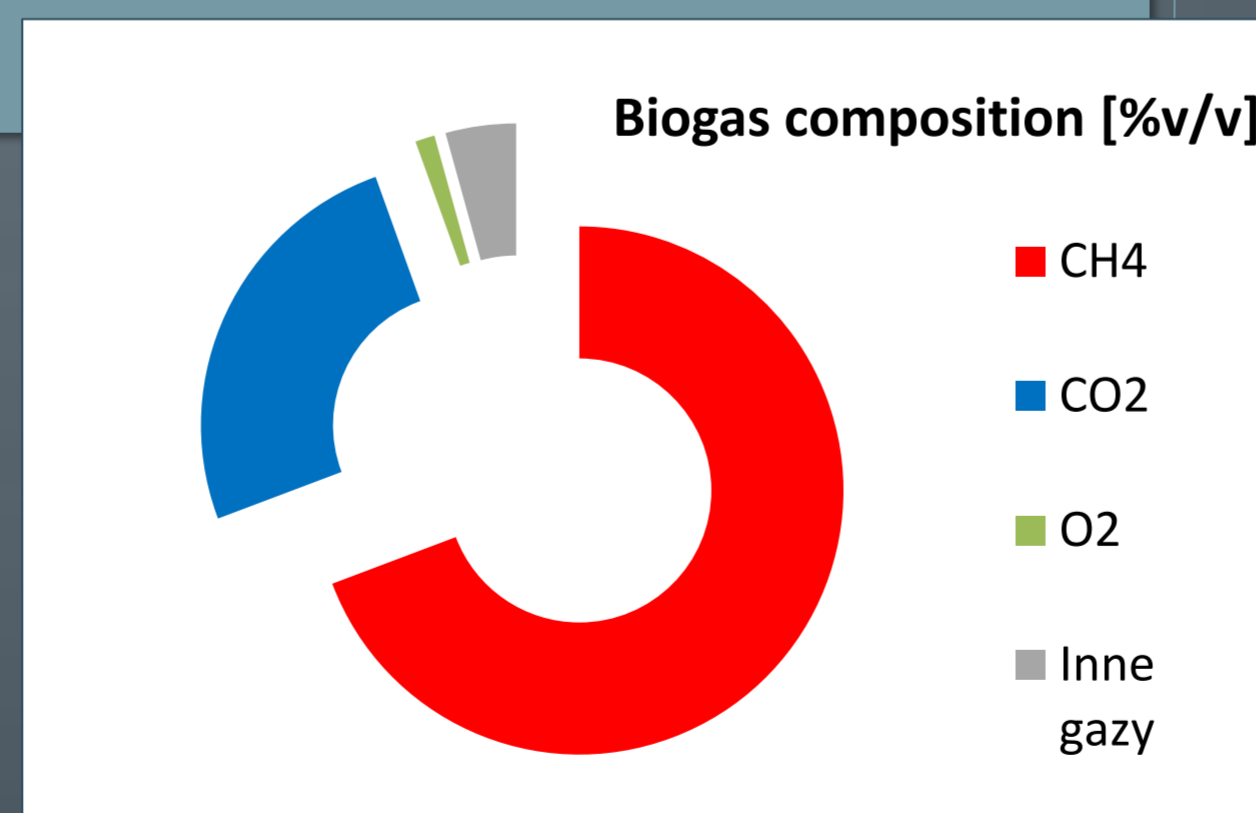
The study was carried out in the 0.5 dm³ fermentors in triplicate. The methane fermentation process was carried out in temperature of 37 °C.

WASTE AFTER FRUIT PROCESSING

BIOGAS-PROFITABILITY

BIOGAS			METANE			BIOGAS COMPOSITION [% v/v]						
Ndm ³ /kg s.m.	Ndm ³ /kg s.m.	Ndm ³ /kg s.m.o.	Ndm ³ CH ₄ /kg s.m.	Ndm ³ CH ₄ /kg s.m.	Ndm ³ CH ₄ /kg s.m.o.	CH ₄ [%]	CO ₂ [%]	O ₂ [%]	H ₂ S [ppm]	H ₂ [ppm]	NH ₃ [ppm]	Inne gazy [%]
32	400	425	22	277	294	69	25	1	39	0	117	4

	Stage of fermentation	
	START	END
pH	7,18	7,79
Redox [mV]	-293	-236
Conductivity [mS]	n.b.	n.b.
d.m. [%]	1,20%	0,88%
d.o. m. [% s.m.]	65,97%	58,11%



DAIRY SEWAGE SLUDGE

BIOGAS PROFITABILITY

BIOGAS			METANE			BIOGAS COMPOSITION [% v/v]						
Ndm ³ /kg s.m.	Ndm ³ /kg s.m.	Ndm ³ /kg s.m.o.	Ndm ³ CH ₄ /kg s.m.	Ndm ³ CH ₄ /kg s.m.	Ndm ³ CH ₄ /kg s.m.o.	CH ₄ [%]	CO ₂ [%]	O ₂ [%]	H ₂ S [ppm]	H ₂ [ppm]	NH ₃ [ppm]	Inne gazy [%]
58	357	410	44	270	311	76	16	1	79	0	219	7

