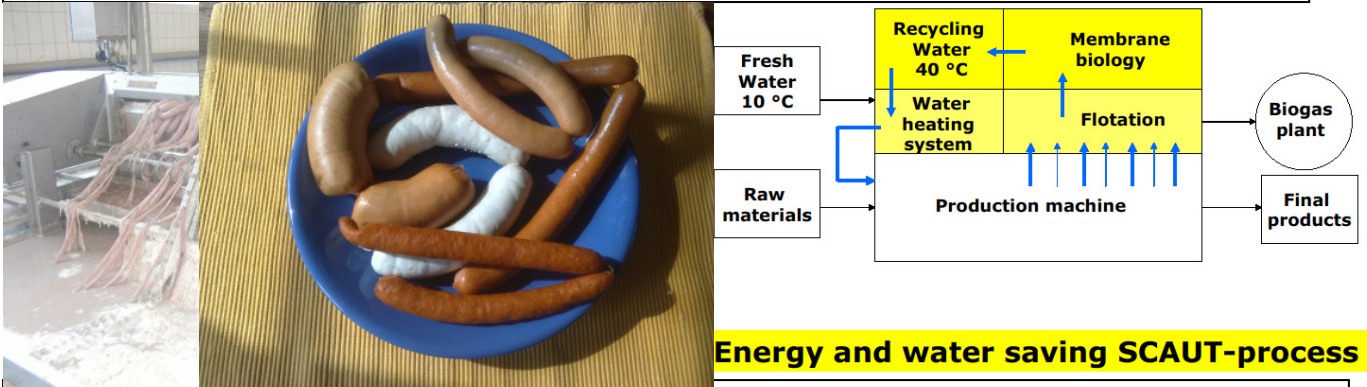


## PURIFICATION AND RECYCLING OF WATER AT A FOOD-PROCESSING PLANT BASED ON THE EXAMPLE OF NATURAL SAUSAGE CASING PRODUCTION USING A PHYSICAL-CHEMICAL-BIOLOGICAL SYSTEM WITH ULTRAFILTRATION MEMBRANES



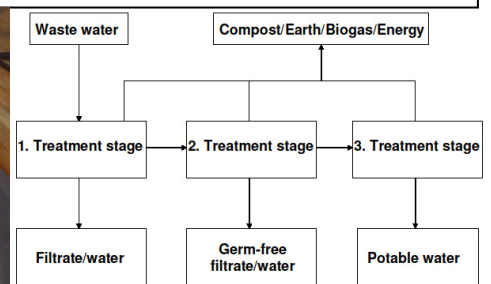
Energy and water saving SCAUT-process

The production of high-quality natural sausage casings generates water, waste water, waste air and solid waste problems. This paper outlines the results of the successful advanced waste water treatment based on ultra filtration. Thus, the SCAUT process is applied to reduce heavy bacteriological, organic and nitrogen contamination to render water fit for human consumption in accordance with European Drinking Water Regulations. This allows the treated water to be reused. The biological process takes place at over 40 °C water temperature. This production temperature saves up to 80 % of heating energy. The SCAUT process can also be successfully applied with other organic waste water combinations and other water reuse targets. The process equally solves other problems such as excess exhaust requirements or those posed by energy rich organic substances.

Table 1: Natural Sausage Casing Production, Analytical Values  
Sampling on June 09, 2009 performed by the Institut für Hygiene, Graz

Sample	Process water	Outlet MBH	Outlet SCAUT process
Pretreatment	None	None	UV unit
Color	Hazdich brown	Yellowish	Colorless
Odor	Precipitation of suspended matter	Cloudy	Clear
Temperature [°C]	Readings	None	None
	45	37	37
Chemical and Physical Tests			
Parameter	Unit	RV/MAC	
Coloration 436 nm	cm	0.5	1.8
			0.1
Bacteriological Tests			
Colony forming units at 22	CFU/ml	100	4,000,000
			> 1,000
Colony forming units at 37	CFU/ml	20	15,000,000
			> 800
Escherichia coli	CFU/100 ml	<=0	80,000,000
			4
Coliform bacteria	CFU/100 ml	0	90,000,000
			120
Enterococci	CFU/100 ml	<=0	0
			0
Pseudomonas aeruginosa	CFU/100 ml	-	0
			90
Clostridium perfringens	CFU/100 ml	-	200
			0
Salmonella	in 250 ml	-	Negative
			0
Chemical Parameters			
COD	mg/l		27.8
			6.1
NH <sub>4</sub> -N	mg/l		0.53
			0.17
NO <sub>3</sub> -N	mg/l		12.1
			10.6

\* RV/MAC = Reference value/maximum allowable concentration



SCAUT-Process

### Analytical results

### Ultra filtration membrane

Heavily bacteriological contaminated  
Waste Water  
Hygienic problems  
Bacteria forcibly filtered  
Physical barrier  
Ultra filtration membranes  
To fulfill drinking European  
drinking water requirements

High sulfur and nitrogen content  
Easily fermenting high-energy organic substances  
Solving "Odor of decay" intolerable problems  
Very good biodegradable wastewater  
Building a biological WWTP  
With nitrification and denitrification  
High efficient environmental facilities  
Water with very high degree of purity