

PENGGUNAAN UP FLOW ANAEROB BIOFILTER TERHADAP PENURUNAN  
KADAR BOD AIR LIMBAH TEMPE DI DESA BANDUNGREJO KECAMATAN  
MRANGGEN KABUPATEN DEMAK

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Industri rumah tangga tempe di Desa Bandungrejo Kecamatan Mranggen Kabupaten Demak memproduksi tempe rata-rata setiap hari mencapai 63,8 kg kedelai per industri. Hasil penelitian dosen FKM Universitas Diponegoro Semarang Tahun 2003 air limbahnya memiliki kadar BOD antara 4.728,5 mg/l - 10.797,2 mg/l, sementara kadar BOD maksimum yang diperbolehkan untuk air limbah industri berdasarkan Keputusan Gubernur Kepala Daerah Tingkat I Jawa Tengah No. 660.l/02/1997 adalah 150 mg/l. Diperlukan suatu upaya pengolahan air limbah dalam kelangsungan produksi tempe yang sehat berkualitas dan mencegah pencemaran lingkungan. *Up flow anaerob biofilter* adalah suatu unit pengolahan air limbah individual secara biologis yang dapat menurunkan kandungan zat organik dan menurunkan kadar BOD. Nilai pH, suhu dan lama kontak mempengaruhi penurunan kadar BOD oleh *up flow anaerob biofilter*.

Penelitian bertujuan mengetahui penggunaan *up flow anaerob biofilter* terhadap penurunan kadar BOD air limbah tempe di desa Bandungrejo Kecamatan Mranggen Kabupaten Demak. Penelitian menggunakan metode *quasi experiment* dengan rancangan *pretest - posttest*. Variabel bebas dalam penelitian adalah penggunaan *up Flow anaerob biofilter* dan variabel terikatnya adalah kadar BOD. Variabel pengganggu yang dikendalikan dalam penelitian adalah lama kontak. Uji statistik menggunakan uji statistik parametrik yaitu uji t untuk dua sampel berpasangan (*paired sample test*) Untuk menguji perbedaan kadar BOD sebelum dan sesudah perlakuan. Hasil dari penelitian ini adalah :rata-rata kadar BOD sebelum perlakuan 3,355,31 mg/l, sesudah perlakuan 590 mg/l. Disimpulkan ada perbedaan kadar BOD air limbah tempe di desa Bandungrejo, Kecamatan Mranggen Kabupaten Demak antara sebelum dan sesudah penggunaan *up flow anaerob biofilter* prosentase penurunan = 82,24%, p valui = 0,0001 < 0,05), Saran dari penelitian ini membuat pengolahan kombinasi antara *biofilter anaerob dan aerob*.

**Kata Kunci:** Air limbah tempe, up flow anaerob biofilter, kadar BOD

*THE USE OF UP FLOW ANAEROB BIOFILTER TO THE BOD DECREASE  
DEGREE OF TEMPE WASTE WATER I BANDUNGREJO VILLAGE MRANGGEN  
SUB DISTRICT OF DEMAK DISTRICT*

*Home industry of Tempe in Bandungrejo Village Mranggen Sub District of Demak. District produces Tempe daily on average of 63,8 kg soybean per industry. A research result performed by Public Health Faculty lecturers of Diponegoro university Semarang in 2003 indicates that the BOD degree of Tempe waste water reaches between 4.728,5 mg/l and 10.797,2 mg/l, while the maximum BOD degree permitted for the home industry waste water of the food production based on Governor Decision of the Region HEad of the first level Central Java no. 660.1/02/1997 is 150 mg/l. In maintaining the healthy quality of tempe production and preventing the environment pollution, it is required a waste water processing effort. Up flow anaerob biofilter is one of the processing units of the individual waste water biologically declining organic compound contents and decreasing BOD degree. pH value, temperature and long-term contact will influence the decline of BOD degree by up flow anaerob biofilter. This research is intended to know the use of up flow anaerob biofilter to the BOD degree in home industry of Tempe waste water in Bandungrejo Village Mranggen sub District of Demak District. This research applies quasi-experiment method with the planning of pretest-posttest. In this research, free variables used are up flow anaerob biofilter and the tied variables are BOD degree. Disturber variable controlled in this research is long-term contact. Statistic test utilized is parametric statistic test, that is, t test of two paired sample tests to examine the distinction of BOD degree before and after the treatment. The result of this research is: the average of BOD degree before treatment 3.355,31 mg/l and after the treatment about 590 mg/l. As the conclusion, there is a difference of BOD degree of Tempe waste water in Bandungrejo Village Mranggen Sub District of Demak District between before and after the usage of up flow anaerob biofilter in which the percentage got declined into 82,41% (p value = 0,000 < 0,05). This research advise to construct a combination processing between biofilter anaerob and aerob.*

*Keyword : tempe waste water, up flow anaerob biofilter, BOD degree*