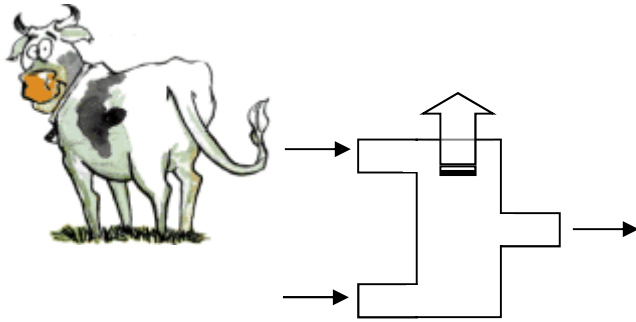


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**EXAMPLE: Really, this is a thing**

In his younger days, Dr. Thom got mixed up with a get-rich-quick scheme that proposed using bovine flatulence as an energy source. The proposed process was to combust methane ( $\text{CH}_4$ ) with air in a steady-state reaction chamber. The process used sufficient air to produce 90%  $\text{CO}_2$ , 10%  $\text{CO}$  and no  $\text{O}_2$  in the products. Both the methane and the air enter at 1 bar and  $25^\circ\text{C}$ . The products leave the chamber at 500 K and 1 bar. Find the heat transfer rate per unit molar flow rate of fuel for the process.



$i$	$\tau$ [K]	$\Delta \bar{h}_f^0$ [kJ/kmol]	$\bar{h}(T)$ [kJ/kmol]	$\bar{h}(298\text{K})$ [kJ/kmol]	$\bar{h}$ [kJ/kmol]
$\text{CO}_2)_2$					
$\text{CO})_2$					
$\text{H}_2\text{O})_2$					
$\text{N}_2)_2$					
$\text{CH}_4)_1$					
$\text{O}_2)_1$					
$\text{N}_2)_1$					