1980 Feb 22

Hog house
heated by body warmth.

This idea was communicated to Dr Lon Crosby about 1977. He could not find anything wrong with it but was busy with other things. At first I was planning to use a heat exchanger but I have now that of using two piles of smooth rocks (cobblestones) alternately. The water condenses and runs out thru a drain in the bottom thru the hog house and protected from freezing.

We seek the limit of such a device.

Obviously the air is fresh and may be sufficient if the blowers are ~~sufficient~~ effective.

Let us suppose that a portion α of the input oxygen is used up by combining with glycogen $(C_6H_{10}O_5)x$

Air (20,9% O) flows thru the hog-house.
Suppose 100 l flows thru. This means 21 l of O_2. Suppose we use 2 l/O_2. This produces

$$2 \times 4.8 = 9.6 \text{ k cal of heat}$$

100 l → 1.23 kg → ,29 kcal/°C

So temp of gas is raised $\frac{9.6 \text{ k cal}}{,29 \text{ kcal}} = 33°C$ temp raise.
when only ~~10~~ 9½% of O is used. Part of the heat is of course used in vaporizing water.

76 0°C

$\frac{32}{22,400}$ → .001429 [21]
O

$\frac{28}{22,400}$ → .00125
N 79

.001225

4.8 $\frac{\text{k cal}}{\text{l of O}}$

100 l air
21 l O
4 | 100.8 k cal of heat
25.2 k cal of heat

air .2404 cal/g } .29
100 l × .0123

$C_6H_{12}O_6$

670

72
12
96

3.722

180g

192g O

15 O → 1/4 g O used

1/4 g O used → .234 g G

→ .872 C

16O+

1925
1760

165
78

89