~~(b)~~. (c)

by simulation 1, $t \approx 544000$ sec

in video, left-end is 75.706 ppm

when $\int_0^l C\,dx = 50$, so this system is finite system.

red line is function of C.

orange line is function of $\int_0^l C\,dx$ at certain t.

purple line is $y = 50$ line.

(d) when d is function of x,

which can be expressed as $d \propto \frac{1}{x}$.

$d = D_0$ at $x = 1$ (l),

and increase with concentration of nitrogen.

by simulation 2, t required to average concentration 50 is 134000sec, quite lower than 544000 sec (answer of c).

~~and only considering the system~~

그리고 이런식 관점에서도 고농도 쪽에서 ~~flux~~ 저농도 쪽으로의 flux가 증가한다면 depletion이 더욱 빠르게 일어날 것이다.