Table S1. Compositions of the NBRIP medium.

Ingredients	Concentration (g/L) for NBRIP for Broth	Concentration (g/L) for NBRIP for Agar
Glucose (Kemaus, Australia)	10.00	10.00
$MgCl_2 \cdot 6H_2O$ (Ajax Finechem, Australia)	5.00	5.00
$MgSO_4 \cdot 7H_2O$ (Kemaus, Australia)	0.25	0.25
KCl (Kemaus, Australia)	0.20	0.20
$(NH_4)_2SO_4$ (Kemaus, Australia)	0.10	0.10
Struvite ($MgNH_4PO_4.6H_2O$) (Alfa Aesar, U.S.A.) or Hydroxyapatite ($Ca_5(PO_4)_3OH$) (Sigma–Aldrich, U.S.A.)	5.00	5.00
Bacto agar (BBL,Baltimore,MD)	-	15.00
Final pH (at 25°C)	7.00 ± 0.30	7.00 ± 0.30

Table S2. PSI values of struvite and hydroxyapatite dissolution by *B. megaterium* (TBRC 1396).

Incubation Time (Days)	PSI Values	
	Struvite	**Hydroxyapatite**
0	0	0
1	0	1.00 ± 0.00
4	2.70 ± 0.12	1.00 ± 0.00
5	2.77 ± 0.03	1.00 ± 0.00
6	2.75 ± 0.14	1.00 ± 0.00
7	2.72 ± 0.31	1.00 ± 0.00

Table S3. Characterization of struvite synthesized from swine wastewater and commercial struvite.

pH	Amount of Struvite (g/800 mL)	Crystallite Size (nm)	Degree of Crystallinity (%)	FOM * (%)
• **Struvite synthesized from swine wastewater**				
7.50	4.45	91.86	91.60	70.30
8.00	4.95	79.55	91.00	87.20
8.50	5.07	89.44	91.20	81.82
9.00	5.30	99.95	91.60	41.32
• **Commercial struvite**				
-	-	75.06	91.70	88.95

* FOM (Figure of merit) = the higher the %FOM is, the better the match

Table S4. Elements in struvite precipitated from swine wastewater.

pH	Trace elements (%)		
	Oxygen (O)	**Phosphorus (P)**	**Magnesium (Mg)**
7.5	53.49 ± 9.14	19.12 ± 5.01	15.00 ± 2.73
8.0	47.96 ± 1.44	21.59 ± 1.15	16.89 ± 1.01
8.5	52.12 ± 2.23	22.96 ± 1.79	18.21 ± 0.95
9.0	43.86 ± 1.49	25.82 ± 0.79	17.80 ± 0.56
Commercial struvite	51.16 ± 0.14	21.29 ± 1.17	16.49 ± 1.06

Table S5. The efficiency of cell encapsulation by sodium alginate.

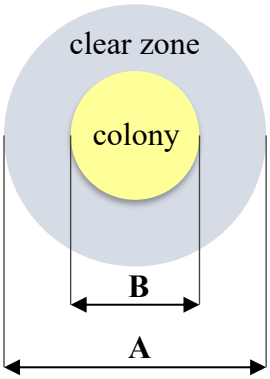
No.	The Number of Bacteria Cells		Encapsulation Efficiency (%)
	Before Encapsulation	After Encapsulation	
1	6.80×10^7	1.00×10^7	89.37
2	7.00×10^7	1.17×10^7	90.10
3	3.90×10^7	4.70×10^6	87.89
Average			89.12

The encapsulation efficiency was calculated according to (Afzaal et al., 2019)

$$\text{Encapsulation efficiency (\%)} = (\log_{10}N / \log_{10}N_0) \times 100$$

When N_0 = The number of bacteria cells before encapsulation (CFU/mL)

N = The number of bacteria cells after encapsulation (CFU/mL)



Phosphate solubilization index (PSI) = A/B

$$PSI = \frac{\text{colony + clear zone diameter}}{\text{colony diameter}}$$

Figure S1. Estimation of phosphate solubilization index (PSI).



Figure S2. Struvite precipitated from swine wastewater.

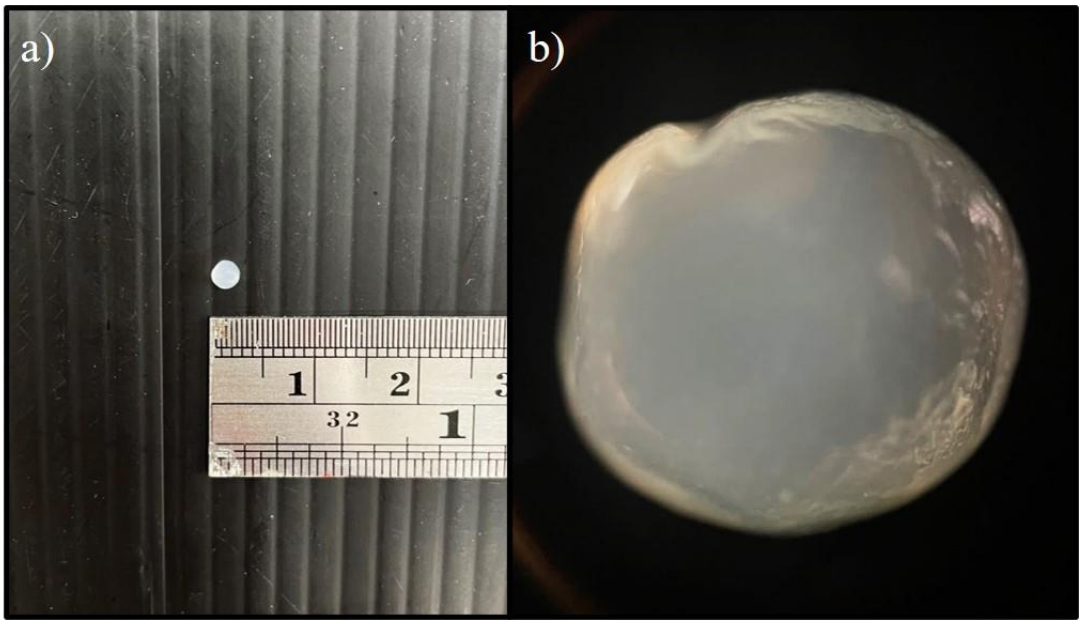


Figure S3. Immobilized cell of *B. megaterium* (TBRC 1396) (**a**) and immobilized cell of *B. megaterium* (TBRC 1396) at 50x magnification (**b**).