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Instability diagnosis and syntrophic acetate oxidation during thermophilic digestion of vegetable waste

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Phase	A: Stable OLR: 1.0	B: First Instable OLR: 1.5	C: Self-recovering OLR: 1.5 - 2.0	D: Second instable OLR: 2.0	E: Collapsed OLR: 2.0 - 2.5
Liquid	<ul style="list-style-type: none"> • Very low VFAs level • TAN loss led to BA ↓ and TA ↓ 	<ul style="list-style-type: none"> • OLR ↑ led to VFAs ↑ • BA ↓, IA ↑, pH ↓ 	<ul style="list-style-type: none"> • Acetate ↓ due to SAO • BA ↑, IA ↓, pH ↑ 	<ul style="list-style-type: none"> • OLR ↑ led to VFAs ↑ • BA ↓ to the 0 with pH 5.70 	<ul style="list-style-type: none"> • Acetate and n-butyrate ↑ • pH ↓ to 4.0 finally
Microorganism	<ul style="list-style-type: none"> • Balance between FB, AB and (AM + HM) 	<ul style="list-style-type: none"> • AM inhibited by VFA • Imbalance between FB, AB and (AM+HM) • SAOB appeared and increased 	<ul style="list-style-type: none"> • SAOB played a major role for disinhibition • Rebalance between FB, AB and (SAOB + AM + HM) 	<ul style="list-style-type: none"> • SAOB, AM and HM were inhibited again • Imbalance between FB, AB and (SAOB + AM + HM) 	<ul style="list-style-type: none"> • SAOB, AM and HM were inhibited completely • FB and AB were also inhibited completely when pH <4.46
Gas	<ul style="list-style-type: none"> • VMPR stabilized 0.28 • CH₄/CO₂ > 1.3 • No hydrogen 	<ul style="list-style-type: none"> • VMPR ↓ • CH₄/CO₂ ↓ • No hydrogen 	<ul style="list-style-type: none"> • VMPR ↑ • CH₄/CO₂ ↑ • No hydrogen 	<ul style="list-style-type: none"> • VMPR ↓ • CH₄/CO₂ ↓↓ • No hydrogen 	<ul style="list-style-type: none"> • VMPR ↓↓ to 0 • CH₄/CO₂ ↓↓ to 0 • Hydrogen detected

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