

Additional file 2: Closed batch dark fermentative biohydrogen production

| Genus | Species | Strain | $Y_{(H_2/S)}$ [mol mol ⁻¹] | q_{H_2} [mmol g ⁻¹ h ⁻¹] | HER [mmol L ⁻¹ h ⁻¹] | Temperature [°C] | pH | Main substrate and discriminative condition | Reference ⁺ |
|-----------------------------|------------------------|------------|---|--|--|---------------------|-----|--|------------------------|
| <i>Acetobacterium</i> | <i>woodii</i> | | 0.06 | | | | | fructose (with Ni) | [205] |
| <i>Acetobacterium</i> | <i>woodii</i> | | 2.94 | | | | | fructose (without Ni) | [205] |
| <i>Acidaminococcus</i> | <i>fermentans</i> | AO | 0.6 | | | 39 | 6.7 | trans-aconitate | [206] |
| <i>Acidaminococcus</i> | <i>fermentans</i> | AO | 1 | | | 39 | 6.7 | citrate | [206] |
| <i>Acidaminococcus</i> | <i>fermentans</i> | DSM 20731 | 0.1 | | | 37 | 7.5 | glutamate | [207] |
| <i>Acidaminococcus</i> | <i>fermentans</i> | DSM 20731 | 0.89 | | | 37 | 7.5 | trans-aconitate | [208] |
| <i>Bacillus</i> | <i>megaterium</i> | ATCC 15374 | | | 0.84 | 35 | | 5 g/L glucose | [209] |
| <i>Bacillus</i> | <i>megaterium</i> | ATCC 15374 | | | 1.17 | 35 | | 10 g/L glucose | [209] |
| <i>Bacillus</i> | <i>megaterium</i> | ATCC 15374 | | | 0.98 | 35 | | 15 g/L glucose | [209] |
| <i>Bacillus</i> | <i>megaterium</i> | ATCC 15374 | | | 1.23 | 35 | | 20 g/L glucose | [209] |
| <i>Bacteroides</i> | <i>fragilis</i> | ATCC 25285 | 0.01 | | 5.56 | 37 | 7.0 | glucose (with vitamin B12) | [98] |
| <i>Bacteroides</i> | <i>fragilis</i> | ATCC 25285 | 0.09 | | 50 | 37 | 7.0 | glucose (without vitamin B12) | [98] |
| <i>Bacteroides</i> | <i>splanchnicus</i> | VPI 6842 | 0.10 | | 55.6 | 37 | 7.0 | glucose (with heme, without vitamin B12) | [98] |
| <i>Bacteroides</i> | <i>splanchnicus</i> | VPI 6842 | 0.14 | | | 37 | 7.0 | glucose (with heme) | [98] |
| <i>Bacteroides</i> | <i>splanchnicus</i> | VPI 6842 | 0.14 | | 77.8 | 37 | 7.0 | glucose (with heme, with vitamin B12) | [98] |
| <i>Bacteroides</i> | <i>splanchnicus</i> | VPI 6842 | 0.91 | | | 37 | 7.0 | glucose (without heme) | [98] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 0.48 | | | 70 | 7.2 | silphium leaves | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 1.75 | | | 70 | 7.2 | sweet shorghum plant | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 1.80 | | | 70 | 7.2 | untreated maize leaves | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 2.30 | | | 70 | 7.2 | bagasse | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 2.63 | | | 70 | 7.2 | vacuum evaporated sweet shorghum juice | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 2.98 | | | 70 | 7.2 | sweet shorghum juice | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 3.67 | | | 70 | 7.2 | pretrated maize leaves | [35] |
| <i>Caldicellulosiruptor</i> | <i>saccharolyticus</i> | DSM 8903 | 3.80 | | | 70 | 7.2 | wheat straw | [35] |

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|--------------------|-----------------------|-------------|-------|-------|------|----|---------|---|-------|
| <i>Caloramator</i> | <i>viterbensis</i> | DSM 13723 | 0.2 | | | 60 | 6 | glucose | [210] |
| <i>Caloramator</i> | <i>viterbensis</i> | DSM 13723 | 0.401 | | | 60 | 6 | glycerol | [210] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | 1.12 | 11.26 | | 30 | | 5 g/L glucose | [211] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | 1.12 | 10.3 | | 30 | | 9 g/L glucose | [211] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | 1.24 | 15.71 | | 30 | | 1.5 g/L glucose | [211] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | | 25.8 | | 30 | | formate | [212] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | | 6.6 | | 30 | | pyruvate | [212] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | | 19.5 | | 30 | | methylviologen | [212] |
| <i>Citrobacter</i> | <i>amalonaticus</i> | Y19 | | 27 | | 30 | | benzylviologen | [212] |
| <i>Citrobacter</i> | sp. | Y19 | 1.05 | 32.3 | | 36 | 6.0-7.0 | 10% (w/v) glucose | [213] |
| <i>Citrobacter</i> | sp. | Y19 | 2.49 | 32.3 | | 36 | 6.0-7.0 | 1% (w/v) glucose | [213] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | ATCC 4259 | 1.178 | | | 34 | 5.4 | glucose (carbon monoxide in headspace) | [214] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | ATCC 4259 | 1.391 | | | 34 | 5.4 | glucose | [214] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | ATCC 824 | 2.3 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | IAM 190011 | | | 0.83 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | IAM 190012 | | | 0.5 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | NCIMB 13357 | 3.28 | | 6.64 | 30 | 7.0 | glucose (no CO ₂ scavenging) | [216] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | NCIMB 13357 | 3.39 | | 3.92 | 30 | 7.0 | glucose (CO ₂ scavenging) | [216] |
| <i>Clostridium</i> | <i>acetobutylicum</i> | X9 | | 6.4 | | 37 | 5.0 | microcrystalline cellulose | [201] |
| <i>Clostridium</i> | <i>beijerinckii</i> | ATCC 25752 | | | 0.69 | 35 | | 5 g/L glucose | [217] |
| <i>Clostridium</i> | <i>beijerinckii</i> | ATCC 25752 | | | 1.08 | 35 | | 10 g/L glucose | [217] |
| <i>Clostridium</i> | <i>beijerinckii</i> | ATCC 25752 | | | 1.48 | 35 | | 15 g/L glucose | [217] |
| <i>Clostridium</i> | <i>beijerinckii</i> | ATCC 25752 | | | 1.3 | 35 | | 20 g/L glucose | [217] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 1.26 | | 12.3 | 36 | 6.5 | xylose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 1.27 | | 6.4 | 36 | 6.5 | galactose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 1.55 | | 22 | 36 | 6.5 | mannose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 1.72 | | 27.3 | 36 | 6.5 | fructose | [82] |

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|--------------------|---------------------|----------|------|------|-------|----|------|---|-------|
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 1.86 | | 27 | 36 | 6.5 | glucose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 2.03 | | 24.8 | 35 | 6.47 | glucose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 2.58 | | 10.2 | 36 | 6.5 | lactose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 3.72 | | 22 | 36 | 6.5 | maltose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 3.9 | | 27.5 | 36 | 6.5 | cellobiose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | 4.20 | | 22.1 | 36 | 6.5 | sucrose | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | Fanp3 | | | 34.3 | 36 | 6.5 | dextrin | [82] |
| <i>Clostridium</i> | <i>beijerinckii</i> | RZF-1108 | 0.61 | 8.38 | | 35 | 10.0 | 10 g/L glucose | [218] |
| <i>Clostridium</i> | <i>beijerinckii</i> | RZF-1108 | 1.86 | 4.46 | | 35 | 7.0 | 10 g/L glucose | [218] |
| <i>Clostridium</i> | <i>beijerinckii</i> | RZF-1108 | 1.97 | 4.65 | 4.93 | 35 | 7.0 | 9 g/L glucose | [218] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | 0.45 | | 0.67 | 37 | 7.5 | xylose (static incubation) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | 0.58 | | 4.02 | 37 | 7.5 | xylose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | 1.1 | | 10.3 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | 1.35 | | 11.2 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 5.53 | 37 | | cassava starch | [220] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 5.27 | 37 | | starch | [220] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 9.4 | 37 | | soluble starch | [221] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 0.59 | 37 | | rice husk | [221] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 0.46 | 37 | | <i>Arabidopsis</i> sp. starch (wildtype) | [221] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS2 | | | 1.47 | 37 | | <i>Arabidopsis</i> sp. starch (<i>sex1-1</i> mutant) | [221] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.7 | | 2.79 | 37 | 7.5 | xylan hydrolysate (static incubation) | [222] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.76 | | 1.2 | 37 | 7.5 | pretreated rice straw hydrolysate | [222] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 0.007 | 37 | 7.5 | pretreated rice straw | [222] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 1.58 | 37 | | xylan | [222] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.5 | | 5.35 | 37 | 7.5 | 10 g COD/L xylose | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.6 | | 4.11 | 37 | 7.5 | 5 g COD/L xylose | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.65 | | 10.3 | 37 | 7.5 | 30 g COD/L xylose | [219] |

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|--------------------|------------------|------------|------|------|-------|----|-----|--|-------|
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.65 | | 11.8 | 37 | 7.5 | 40 g COD/L xylose | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.7 | | 9.59 | 37 | 7.5 | 20 g COD/L xylose | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.72 | | 5.58 | 37 | 7.5 | xylose (static incubation) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 1.3 | | 8.92 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 0.98 | | 11.87 | 37 | 7.5 | sucrose (incubation by shaking) | [29] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 1.01 | | 8.54 | 37 | 7.5 | glucose | [29] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 1.05 | | 2.57 | 37 | 7.5 | xylose (incubation by shaking) | [29] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | 1.15 | | 7.53 | 37 | 7.5 | fructose | [29] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 0.005 | 37 | 7.5 | 0.97 g/L carboxymethyl cellulose hydrolysate | [223] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 0.044 | 37 | 7.5 | 1.27 g/L carboxymethyl cellulose hydrolysate | [223] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 0.014 | 37 | 7.5 | xylan hydrolysate (incubation by shaking) | [223] |
| <i>Clostridium</i> | <i>butyricum</i> | CGS5 | | | 9.2 | 37 | | soluble starchw | [221] |
| <i>Clostridium</i> | <i>butyricum</i> | DSM 10702 | | | 9.15 | 30 | 7.5 | glucose | [224] |
| <i>Clostridium</i> | <i>butyricum</i> | IAM 19002 | | | 1.44 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>butyricum</i> | IAM 19003 | | | 1.67 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO 3847 | | | 1.75 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO 3847 | 1.64 | | 0.45 | 37 | 7.0 | glucose (cells gel-immobilized) | [225] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO 3847 | 3.55 | | 0.975 | 37 | 7.0 | glucose (cells gel-immobilized, washing and reutilization) | [225] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO13949 | 1.8 | | | 30 | 7.0 | starch, 15 mM glutamat acid | [226] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO13949 | 1.9 | | | 30 | 7.0 | starch, 5 mM glutamat acid | [226] |
| <i>Clostridium</i> | <i>butyricum</i> | IFO13949 | 1.9 | | | 30 | 7.0 | starch, 10 mM glutamat acid | [226] |
| <i>Clostridium</i> | <i>butyricum</i> | M1 | 0.11 | | 0.22 | 40 | | glucose | [227] |
| <i>Clostridium</i> | <i>butyricum</i> | M1 | | | 0.16 | 40 | | brewery yeast waste | [227] |
| <i>Clostridium</i> | <i>butyricum</i> | SC-E1 | 2.0 | | | 30 | 6.7 | glucose and polypeptone | [228] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 0.75 | 5.26 | | 37 | 8.0 | sugarcane bargasse hydrolysate | [229] |

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|--------------------|-----------------------|------------|------|-------|--|----|-----|---|-------|
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.07 | 7.44 | | 37 | 7.0 | sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.09 | 7.93 | | 37 | 6.5 | sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.21 | 8.98 | | 37 | 6.0 | sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.39 | 2.32 | | 37 | 5.5 | 2.59 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.41 | 11.01 | | 37 | 5.5 | 40.74 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.43 | 4.70 | | 37 | 5.5 | 5.33 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.46 | 1.40 | | 37 | 5.5 | 1.49 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.51 | 9.12 | | 37 | 5.5 | 10.55 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.73 | 12.65 | | 37 | 5.5 | 20 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | TISTR 1032 | 1.73 | 12.63 | | 37 | 5.5 | 20.66 g COD/L sugarcane bagasse hydrolysate | [229] |
| <i>Clostridium</i> | <i>butyricum</i> | | 2.25 | | | 30 | 6.0 | cellobiose | [230] |
| <i>Clostridium</i> | <i>butyricum</i> | | 1.63 | | | 37 | 7.0 | glucose | [231] |
| <i>Clostridium</i> | <i>celerecrescens</i> | DSM5628 | 1.25 | | | 35 | 6.5 | cellulose (Avicel) | [215] |
| <i>Clostridium</i> | <i>celerecrescens</i> | DSM5628 | 1.5 | | | 35 | 6.5 | cellulose (MN 301) | [215] |
| <i>Clostridium</i> | <i>celerecrescens</i> | DSM5628 | 1.6 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>cellobioparum</i> | DSM 1351 | 1.1 | | | 35 | 6.5 | cellulose (Avicel) | [215] |
| <i>Clostridium</i> | <i>cellobioparum</i> | DSM 1351 | 1.45 | | | 35 | 6.5 | cellulose (MN 301) | [215] |
| <i>Clostridium</i> | <i>cellobioparum</i> | DSM 1351 | 1.9 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>cellobioparum</i> | | 1.57 | | | 39 | 6.8 | 0.6% (w/v) glucose | [232] |
| <i>Clostridium</i> | <i>cellobioparum</i> | | 2.04 | | | 39 | 6.8 | 0.4% (w/v) glucose (headspace gas regularly released) | [232] |
| <i>Clostridium</i> | <i>cellobioparum</i> | | 2.11 | | | 39 | 6.8 | 0.2% (w/v) glucose | [232] |
| <i>Clostridium</i> | <i>cellobioparum</i> | | 2.11 | | | 39 | 6.8 | 0.6% (w/v) glucose (headspace gas regularly released) | [232] |
| <i>Clostridium</i> | <i>cellobioparum</i> | | 2.24 | | | 39 | 6.8 | 0.4% (w/v) glucose | [232] |

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|--------------------|------------------------|-------------|-------|--|------|----|-----|---|-------|
| <i>Clostridium</i> | <i>cellobioparum</i> | | 2.54 | | | 39 | 6.8 | 0.2% (w/v) glucose (headspace gas regularly released) | [232] |
| <i>Clostridium</i> | <i>cellulolyticum</i> | ATCC 35319 | 1.6 | | | 35 | 6.5 | cellulose (Avicel) | [215] |
| <i>Clostridium</i> | <i>cellulolyticum</i> | ATCC 35319 | 1.7 | | | 35 | 6.5 | cellulose (MN 301) | [215] |
| <i>Clostridium</i> | <i>cellulolyticum</i> | ATCC 35319 | 1.8 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>chartatabidum</i> | | 1.26 | | | 39 | | cellobiose | [233] |
| <i>Clostridium</i> | <i>cochlearium</i> | DSM 1285 | 0.084 | | | 37 | 7.5 | glutamate | [207] |
| <i>Clostridium</i> | <i>cochlearium</i> | DSM 1285 | 1.0 | | | 37 | 7.5 | citrate | [207] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.11 | 40 | 6.8 | peptone and yeast extract | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.54 | 40 | 6.8 | formic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.11 | 40 | 6.8 | acetic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.1 | 40 | 6.8 | propionic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.4 | 40 | 6.8 | pyvuric acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.15 | 40 | 6.8 | lactic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.13 | 40 | 6.8 | succinic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.31 | 40 | 6.8 | maleic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.11 | 40 | 6.8 | citric acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.62 | 40 | 6.8 | glucose | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.53 | 40 | 6.8 | acetic acid, lactic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.19 | 40 | 6.8 | lactic acid, succinic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.13 | 40 | 6.8 | acetic acid, succinic acid | [234] |
| <i>Clostridium</i> | <i>diolis</i> | JPCC H-3 | | | 0.51 | 40 | 6.8 | acetic acid, lactic acid, succinic acid | [234] |
| <i>Clostridium</i> | <i>homopropionicum</i> | LuHBu1 | 1.35 | | | 37 | 7.2 | fructose | [130] |
| <i>Clostridium</i> | <i>hungatei</i> | ATCC 700212 | 1.65 | | | 30 | 7.2 | cellulose and NH ₄ Cl | [131] |
| <i>Clostridium</i> | <i>hungatei</i> | ATCC 700212 | 1.92 | | | 30 | 7.2 | cellulose | [131] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH1 | 1.9 | | 13.4 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH1 | 2.1 | | 15.6 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 2.25 | | 15.4 | 37 | 7.5 | sucrose (static incubation) | [219] |

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|--------------------|-----------------------------------|-------------|------|--|------|----|-----|------------------------------------|-------|
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 2.4 | | 4.91 | 37 | 7.5 | 5 g COD/L sucrose | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 3.1 | | 17.0 | 37 | 7.5 | 10 g COD/L sucrose | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 3.1 | | 22.5 | 37 | 7.5 | 20 g COD/L sucrose | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 3.15 | | 22.8 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 4 | | 25.0 | 37 | 7.5 | 30 g COD/L sucrose | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 4.14 | | 25.4 | 37 | 7.5 | 40 g COD/L sucrose | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | 3.80 | | | 32 | 7.0 | sucrose | [235] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | | | 2.81 | 37 | | cassava starch | [220] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH4 | | | 2.23 | 37 | | starch | [220] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH5 | 1.5 | | 13.6 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH5 | 2 | | 18.1 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH7 | 1.45 | | 9.82 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Clostridium</i> | <i>pasteurianum</i> | CH7 | 2.2 | | 18.5 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Clostridium</i> | <i>peptidivorans</i> | DSM 12505 | 1 | | | 37 | 7 | cysteine | [137] |
| <i>Clostridium</i> | <i>perfringens</i> | strain A | | | 0.11 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>perfringens</i> | strain B | | | 0.14 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>perfringens</i> | strain C | | | 0.5 | 37 | 7 | glucose | [120] |
| <i>Clostridium</i> | <i>phytofermentans</i> | ATCC 700394 | 1 | | | 35 | 6.5 | cellulose (Avicel) | [215] |
| <i>Clostridium</i> | <i>phytofermentans</i> | ATCC 700394 | 1.4 | | | 35 | 6.5 | cellulose (MN 301) | [215] |
| <i>Clostridium</i> | <i>phytofermentans</i> | ATCC 700394 | 1.55 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>populeti</i> | DSM 5832 | 1.45 | | | 35 | 6.5 | cellulose (Avicel) | [215] |
| <i>Clostridium</i> | <i>populeti</i> | DSM 5832 | 1.6 | | | 35 | 6.5 | cellulose (MN 301) | [215] |
| <i>Clostridium</i> | <i>populeti</i> | DSM 5832 | 1.85 | | | 35 | 6.5 | cellobiose | [215] |
| <i>Clostridium</i> | <i>saccharoperbutylacetonicum</i> | ATCC 13564 | 1.40 | | | 37 | 6.0 | glucose (incubation with light) | [236] |
| <i>Clostridium</i> | <i>saccharoperbutylacetonicum</i> | ATCC 13564 | 3.10 | | | 37 | 6.0 | glucose (incubation without light) | [236] |
| <i>Clostridium</i> | <i>saccharoperbutylacetonicum</i> | ATCC 27021 | 0.74 | | 5 | 30 | 6.0 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylacetonicum</i> | ATCC 27021 | 1.20 | | 6.2 | 30 | 7.5 | fructose | [237] |

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|--------------------|---------------------------------|------------|------|--|-------|----|------|---------------------|-------|
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 1.31 | | 9.55 | 30 | 6.5 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 1.40 | | 9.25 | 30 | 8.0 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 1.43 | | 9.4 | 30 | 7.5 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 1.58 | | 11.35 | 30 | 7.0 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 1.72 | | 10 | 30 | 8.5 | glucose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 2.77 | | 1.1 | 30 | 7.5 | maltose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 2.82 | | 5.4 | 30 | 7.5 | lactose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | 2.83 | | 8.75 | 30 | 7.5 | sucrose | [237] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 8.67 | 30 | 5.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 10.5 | 30 | 6.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 6.54 | 30 | 7.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 6.45 | 30 | 8.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 5.32 | 30 | 9.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | <i>saccharoperbutylaceticum</i> | ATCC 27021 | | | 11.78 | 30 | 10.0 | diluted cheese whey | [238] |
| <i>Clostridium</i> | sp. | CB5 | 1.6 | | | | 4.0 | glucose | [180] |
| <i>Clostridium</i> | sp. | CB5 | 2.24 | | | | 5.0 | glucose | [180] |
| <i>Clostridium</i> | sp. | CB5 | 2.66 | | | | 6.0 | glucose | [180] |
| <i>Clostridium</i> | sp. | CB5 | 2.77 | | | | 7.0 | glucose | [180] |
| <i>Clostridium</i> | sp. | DMHC-10 | 0.04 | | 0.006 | 37 | 4.0 | glucose | [230] |
| <i>Clostridium</i> | sp. | DMHC-10 | 2.38 | | 2.96 | 37 | 7.0 | glucose | [230] |
| <i>Clostridium</i> | sp. | DMHC-10 | 2.76 | | 3.569 | 37 | 6.0 | glucose | [230] |
| <i>Clostridium</i> | sp. | DMHC-10 | 3.35 | | 3.978 | 37 | 5.0 | glucose | [230] |
| <i>Clostridium</i> | sp. | Fanp2 | 2.4 | | | 36 | 6.5 | glucose | [239] |
| <i>Clostridium</i> | sp. | Fanp2 | 2.53 | | 12.3 | 36 | 6.47 | glucose | [55] |
| <i>Clostridium</i> | sp. | R1 | 0.63 | | | 30 | 6.0 | xylose | [230] |
| <i>Clostridium</i> | sp. | R1 | 1.66 | | | 30 | 6.0 | galactose | [230] |
| <i>Clostridium</i> | sp. | R1 | 1.68 | | | 30 | 6.0 | mannose | [230] |
| <i>Clostridium</i> | sp. | R1 | 2.01 | | | 30 | 6.0 | glucose | [230] |
| <i>Clostridium</i> | sp. | R1 | 3.09 | | | 30 | 6.0 | sucrose | [230] |

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|--------------------|-----|--------------|-----------|--|------|----|-----|--|-----------|
| <i>Clostridium</i> | sp. | R1 | 3.13 | | | 30 | 6.0 | maltose | [230] |
| <i>Clostridium</i> | sp. | R1 | 3.24 | | | 30 | 6.0 | lactose | [230] |
| <i>Clostridium</i> | sp. | R1 | 2.11 | | | 30 | 6.0 | cellobiose, 200 mg/L sulfide | [53] |
| <i>Clostridium</i> | sp. | R1 | 2.98 | | | 30 | 6.0 | cellobiose, 5 mg/L nitrite | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.2 | | | 30 | 6.0 | cellobiose, 50 mg/L sulfide | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.21 | | | 30 | 6.0 | cellobiose, 1 mg/L nitrite | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.3 | | | 30 | 6.0 | cellobiose, 75 mg/L sulfide | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.47 | | | 30 | 6.0 | cellobiose, 0.1 mg/L nitrite | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.54 | | | 30 | 6.0 | cellobiose, 0.01 mg/L nitrite | [53] |
| <i>Clostridium</i> | sp. | R1 | 3.52-3.57 | | | 30 | 6.0 | cellobiose | [53, 230] |
| <i>Clostridium</i> | sp. | strain no. 2 | 0.29 | | 14 | 36 | 6.8 | xylose | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | 0.3 | | 15.6 | 36 | 6.8 | xylose (incubation with albazyme) | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | 2.42 | | 17.9 | 36 | 6.8 | xylose | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | 2.63 | | 21.5 | 36 | 6.8 | glucose | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | | | 18.9 | 36 | 6.8 | avicel hydrolysate | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | | | 18.8 | 36 | 6.8 | xylan hydrolysate | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | | | 5.87 | 36 | 6.8 | xylan | [240] |
| <i>Clostridium</i> | sp. | strain no. 2 | | | 15.6 | 36 | 6.8 | xylan (incubation with albazyme) | [240] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.63 | 60 | 7.0 | Whatman filter paper (static incubation) | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 2.6 | 60 | 7.0 | Whatman filter paper (incubation by shaking) | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 2.6 | 60 | 7.0 | avicel | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 2.5 | 60 | 7.0 | cellulose | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.9 | 60 | 7.0 | rice straw | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.9 | 60 | 7.0 | bargasse | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.7 | 60 | 7.0 | napiersgrass | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.7 | 60 | 7.0 | wheat straw | [54] |
| <i>Clostridium</i> | sp. | TCW1 | | | 0.7 | 60 | 7.0 | corn cob | [54] |

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|--------------------|---------------------------|------------|-------|--|-------|----|-------------|-------------------------------------|-------|
| <i>Clostridium</i> | sp. | X53 | | | 6.02 | 35 | 6.8 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 7.36 | 40 | 6.8 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 0.76 | 45 | 6.8 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 7.14 | 40 | 5.0 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 10.71 | 40 | 6.0 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 2.5 | 40 | 7.0 | xylan | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 7.05 | 40 | 6.8 | xylan (pH not controlled) | [241] |
| <i>Clostridium</i> | sp. | X53 | | | 3.02 | 36 | 6.5 | xylose | [241] |
| <i>Clostridium</i> | <i>sporosphaeroides</i> | ATCC 25781 | 0.3 | | | 37 | 7.5 | crotonate | [207] |
| <i>Clostridium</i> | <i>sporosphaeroides</i> | ATCC 25781 | 0.33 | | | 37 | 7.5 | glutamate | [207] |
| <i>Clostridium</i> | <i>sporosphaeroides</i> | ATCC 25781 | 0.74 | | | 37 | 7.5 | citrate | [207] |
| <i>Clostridium</i> | <i>symbiosum</i> | HB 25 | 0.06 | | | 37 | 7.5 | glutamate | [207] |
| <i>Clostridium</i> | <i>tetanomorphum</i> | DSM 528 | 0.197 | | | 37 | 7.5 | glutamate | [207] |
| <i>Clostridium</i> | <i>thermoalcaliphilum</i> | DSM 7309 | | | 0.09 | 50 | 10.5 | yeast extract, tryptone | [242] |
| <i>Clostridium</i> | <i>thermoalcaliphilum</i> | DSM 7309 | | | 0.37 | 50 | 10.5 | yeast extract, tryptone, glucose | [242] |
| <i>Clostridium</i> | <i>thermoalcaliphilum</i> | DSM 7309 | | | 0.14 | 50 | 7.5 | yeast extract, tryptone | [242] |
| <i>Clostridium</i> | <i>thermoalcaliphilum</i> | DSM 7309 | | | 0.1 | 50 | 7.5 | yeast extract, tryptone, glucose | [242] |
| <i>Clostridium</i> | <i>thermobutyricum</i> | DSM 4928 | 0.36 | | | 57 | 8.4- 8.6 | pyruvate | [243] |
| <i>Clostridium</i> | <i>thermobutyricum</i> | DSM 4928 | 1.76 | | | 57 | 8.4- 8.6 | glucose and 0.3% yeast extract | [243] |
| <i>Clostridium</i> | <i>thermobutyricum</i> | DSM 4928 | 2.4 | | | 57 | 8.4- 8.6 | glucose and 2% yeast extract | [243] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 0.99 | | | 60 | 6.38 | delignified wood fibers | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.13 | | | 60 | 6.04 | cellobiose | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.47 | | | 60 | 6.95 | delignified wood fibers | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.63 | | | 60 | 7.28 | cellobiose | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.7 | | | 60 | | whatman paper | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.73 | | | 60 | 6.88 | cellobiose | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.9 | | | 60 | | cellulose | [244] |

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|--------------------|------------------------------|------------|-------|------|------|----|---------|--|-------|
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 2.32 | | | 60 | 7.08 | delignified wood fibers | [244] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.28 | 3.99 | | 60 | 7.25 | 5 g/L cellulose | [245] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 1.90 | 6.41 | | 60 | 7.25 | 1 g/L cellulose | [245] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | | 8.4 | | 60 | 7.35 | 0,1 g/L cellobiose | [246] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | | 12.9 | | 60 | 7.35 | 1,1 g/L cellobiose | [246] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | | 14.6 | | 60 | 7.35 | 4.5 g/L cellobiose | [246] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 0.14 | | 0.23 | 60 | 7.2 | cellulose | [247] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 0.21 | | 0.09 | 60 | 7.2 | barley hulls | [247] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 0.22 | | 0.23 | 60 | 7.2 | dried distiller grains | [247] |
| <i>Clostridium</i> | <i>thermocellum</i> | ATCC 27405 | 0.23 | | 0.24 | 60 | 7.2 | barley hulls (contaminated) | [247] |
| <i>Clostridium</i> | <i>thermocellum</i> | JN4 | 0.8 | | | 60 | | microcrystalline cellulose | [142] |
| <i>Clostridium</i> | <i>thermocellum</i> | LQ8 | 0.85 | | | 60 | 7.8 | cellulose | [248] |
| <i>Clostridium</i> | <i>thermocellum</i> | LQ8 | 2.25 | | | 60 | 7.8 | cellulose (incubation with <i>M. thermoautotrophicum</i> Δ H) | [248] |
| <i>Clostridium</i> | <i>thermohydrosulfuricum</i> | 39E | 0.015 | | | 65 | | starch | [249] |
| <i>Clostridium</i> | <i>thermohydrosulfuricum</i> | 39E | 0.017 | | | 65 | | glucose | [249] |
| <i>Clostridium</i> | <i>thermohydrosulfuricum</i> | 39E | 0.017 | | | 65 | | maltose | [249] |
| <i>Clostridium</i> | <i>thermohydrosulfuricum</i> | ATCC 33223 | 0.45 | | | 60 | | glucose (initial heaspace gas 100% N ₂) | [250] |
| <i>Clostridium</i> | <i>thermohydrosulfuricum</i> | ATCC 33223 | 0.55 | | | 60 | | glucose (initial heaspace gas 100% H ₂) | [250] |
| <i>Clostridium</i> | <i>thermolacticum</i> | DSM 2910 | 1.46 | | | 60 | 7-7.2 | lactose | [251] |
| <i>Clostridium</i> | <i>thermolacticum</i> | DSM 2911 | 2.00 | | | 65 | 7.2-7.4 | lactose | [251] |
| <i>Clostridium</i> | <i>thermosuccinogenes</i> | DSM 5809 | 0.10 | | | 37 | 6.5 | inulin | [252] |
| <i>Clostridium</i> | <i>thermosuccinogenes</i> | DSM 5809 | 0.14 | | | 47 | 6.5 | inulin | [252] |
| <i>Clostridium</i> | <i>thermosuccinogenes</i> | DSM 5809 | 0.15 | | | 58 | 6.5 | inulin | [252] |
| <i>Clostridium</i> | <i>thermosuccinogenes</i> | DSM 5809 | 0.25 | | | 70 | 6.5 | inulin | [252] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | 4B | 0.104 | | | 60 | | glucose | [249] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | 4B | 0.123 | | | 60 | | maltose | [249] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | 4B | 0.146 | | | 60 | | starch | [249] |

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|---------------------|---------------------------|------------|-------|----|-------|----|---------|-------------------|-------|
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | DSM 2229 | 0.95 | | 0.96 | 60 | 5.5-6.5 | glucose | [253] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | DSM 2229 | | | 1.32 | 60 | 5.5-6.5 | pectin | [253] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | DSM 2229 | | | 1 | 60 | 5.5-6.5 | polygalacturonate | [253] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | DSM 2229 | | | 0.72 | 60 | 5.5-6.5 | xylose | [253] |
| <i>Clostridium</i> | <i>thermosulfurogenes</i> | DSM 2229 | | | 0.7 | 60 | 5.5-6.5 | arabinose | [253] |
| <i>Clostridium</i> | <i>uliginosum</i> | DSM 12992 | 2.6 | | | 20 | 6.9 | xylose | [254] |
| <i>Clostridium</i> | <i>uliginosum</i> | DSM 12992 | 2.7 | | | 20 | 6.9 | mannose | [254] |
| <i>Clostridium</i> | <i>uliginosum</i> | DSM 12992 | 3.6 | | | 20 | 6.9 | glucose | [254] |
| <i>Clostridium</i> | <i>uliginosum</i> | DSM 12992 | 5.8 | | | 20 | 6.9 | cellobiose | [254] |
| <i>Clostridium</i> | <i>ultunense</i> | DSM 10521 | 0.004 | | | 37 | 7.0 | cysteine | [255] |
| <i>Clostridium</i> | <i>ultunense</i> | DSM 10521 | 0.025 | | | 37 | 7.0 | pyruvate | [255] |
| <i>Clostridium</i> | <i>ultunense</i> | DSM 10521 | 0.08 | | | 37 | 7.0 | glucose | [255] |
| <i>Enterobacter</i> | <i>aerogenes</i> | A-1 | 0.84 | | 3.25 | 37 | 6.8 | glucose | [256] |
| <i>Enterobacter</i> | <i>aerogenes</i> | ATCC 29007 | | 19 | | 38 | 6.13 | glucose | [86] |
| <i>Enterobacter</i> | <i>aerogenes</i> | AY-2 | 1.17 | | 4.23 | 37 | 6.8 | glucose | [256] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 0.83 | | | 35 | 6.5 | lactose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 0.88 | | | 35 | 6.5 | fructose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 0.95 | | | 35 | 6.5 | galactose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 0.98 | | | 35 | 6.5 | mannose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 1.68 | | | 35 | 6.5 | mannitol | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 1.89 | | | 35 | 6.5 | surcose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 2.16 | | | 35 | 6.5 | maltose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 13.39 | 30 | 7 | glucose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | 1 | | 16.95 | 35 | 6.5 | glucose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 13.83 | 38 | 6.5 | glucose | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | | 35 | 6.5 | starch | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | | 35 | 6.5 | cellulose | [257] |

| | | | | | | | | | |
|---------------------|------------------|--------|------|--|------|----|-----|---|-------|
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | | 35 | 6.5 | dextrin | [257] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 8.9 | 37 | 6.5 | glucose (cells immobilized in carrageenan) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 8.7 | 37 | 6.5 | glucose (cells immobilized in calcium alginate) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 11.2 | 37 | 6.5 | glucose (cells immobilized in agar) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 12.5 | 37 | 6.5 | glucose (cells immobilized on polyester) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 16.4 | 37 | 6.5 | glucose (cells immobilized in chitosan beads) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 15.3 | 37 | 6.5 | glucose (cells immobilized on glass beads) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 12.9 | 37 | 6.5 | glucose (cells immobilized on cellulose foam) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 7.2 | 37 | 6.5 | glucose (cells immobilized in carrageenan) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 4 | 37 | 6.5 | glucose (cells immobilized in calcium alginate) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 7.7 | 37 | 6.5 | glucose (cells immobilized in agar) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 6.3 | 37 | 6.5 | glucose (cells immobilized on polyester) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 6.1 | 37 | 6.5 | glucose (cells immobilized in chitosan beads) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 11.6 | 37 | 6.5 | glucose (cells immobilized on glass beads) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HO-39 | | | 6.0 | 37 | 6.5 | glucose (cells immobilized on cellulose foam) | [258] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.71 | | | 37 | 6.8 | 10 g/L glycerol (from biodiesel) | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.82 | | | 37 | 6.8 | 25 g/L glycerol | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.89 | | | 37 | 6.8 | 10 g/L glycerol | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.9 | | | 37 | 6.8 | 3.3 g/L glycerol (from biodiesel) | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 1.05 | | | 37 | 6.8 | 5 g/L glycerol | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 1.12 | | | 37 | 6.8 | 1.17 g/L glycerol (from biodiesel) | [259] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.28 | | | 37 | 6.8 | gluconate | [260] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.34 | | | 37 | 6.8 | galactose | [260] |

| | | | | | | | | | |
|---------------------|--------------------|----------------------|-------|--|-------|----|-----|---|-------|
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.39 | | | 37 | 6.8 | fructose | [260] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.9 | | | 37 | 6.8 | sorbitol | [260] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.95 | | | 37 | 6.8 | mannitol | [260] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.56 | | 2.16 | 37 | 6.8 | 20 g/L glucose | [256] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HU-101 | 0.80 | | | 37 | 6.8 | 10 g/L glucose | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | HZ-3 | 0.83 | | 3.42 | 37 | 6.8 | glucose | [256] |
| <i>Enterobacter</i> | <i>aerogenes</i> | IAM 1183 | | | 1.37 | 37 | | lactose | [262] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-1 | 1.03 | | | 37 | 7.2 | glucose | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-1 | 1.10 | | | 37 | 6.4 | glucose | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-1 | 1.21 | | | 37 | 6.0 | glucose | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-1 | 1.21 | | | 37 | 6.8 | glucose (pH controlled) | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-1 | 1.76 | | | 37 | 6.8 | glucose (pH not controlled) | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | VP-2 | 1.06 | | | 37 | 6.8 | glucose | [261] |
| <i>Enterobacter</i> | <i>aerogenes</i> | | | | 9.4 | 38 | 7 | glucose | [263] |
| <i>Enterobacter</i> | <i>agglomerans</i> | C-1 | 1.03 | | | 30 | 7.0 | glucose | [264] |
| <i>Enterobacter</i> | <i>agglomerans</i> | C-2 | 1.035 | | | 30 | 7.0 | glucose | [264] |
| <i>Enterobacter</i> | <i>agglomerans</i> | CDC 811-74 | 1.014 | | | 30 | 7.0 | glucose | [264] |
| <i>Enterobacter</i> | <i>cloacae</i> | F.P 01 | 2.71 | | | 36 | 5.0 | maltose | [265] |
| <i>Enterobacter</i> | sp. | 18P16 | 0.34 | | | 37 | | cellulose | [266] |
| <i>Enterobacter</i> | sp. | CN1 | 2.0 | | 1.81 | 40 | 7.0 | xylose | [85] |
| <i>Enterobacter</i> | sp. | CN1 | | | 1.64 | 40 | 7.0 | glucose | [85] |
| <i>Enterobacter</i> | sp. | CN1 | | | 1.45 | 40 | 7.0 | sucrose | [85] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) pFEGA | | | 0.026 | 30 | | glycerol | [267] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) pFEGA pISC | | | 0.018 | 30 | | glycerol | [267] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) | | | 0.26 | 37 | | glucose/formate (hydrogenase 1 of <i>E. coli</i>) | [268] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) | | | 0.11 | 37 | | glucose (hydrogenase 1 of <i>E. coli</i>) | [268] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) | | | 0.18 | 37 | | glucose (NiFe hydrogenase of <i>M. marinus</i>) | [269] |

| | | | | | | | | | |
|--------------------|-------------|---|-------|--|-------|----|-----|----------|-------|
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3) Δ IscR pFEGA | | | 0.076 | 30 | | glycerol | [267] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3)H | 0.006 | | | 37 | 7.0 | glucose | [270] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3)HFdY | 0.009 | | | 37 | 7.0 | glucose | [270] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3)HFdYg | 0.014 | | | 37 | 7.0 | glucose | [270] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3)HFdYz | 0.007 | | | 37 | 7.0 | glucose | [270] |
| <i>Escherichia</i> | <i>coli</i> | BL21(DE3)HFdYzg | 0.022 | | | 37 | 7.0 | glucose | [270] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 | | | 2.64 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 | | | 1.1 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>fhlA</i> | | | 0.11 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>fhlA</i> /pCA24N | | | 0.07 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>fhlA</i> /pCA24N-FhlA | | | 3 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> | | | 0.35 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC</i> | | | 3.52 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC</i> | | | 3.52 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC fhlA</i> | | | 0.09 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC fhlA</i> /pCA24N | | | 0.07 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC fhlA</i> /pCA24N- FhlA | | | 3 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> | | | 5.28 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA fdnG</i> | | | 3.08 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA fdnG</i> <i>fdoG</i> | | | 10.98 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA fdoG</i> | | | 11.66 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA fdoG</i> <i>focA</i> | | | 10.56 | 37 | | formate | [65] |

| | | | | | | | | | |
|--------------------|-------------|---|--|--|------|----|--|---------|------|
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> <i>fdoG/pCA24N</i> | | | 14.5 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> <i>fdoG/pCA24N-FhIA</i> | | | 17.8 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA fnr</i> | | | 1.1 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focA</i> | | | 5.28 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focA</i> <i>focB</i> | | | 2.64 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focA</i> <i>focB narG</i> | | | 7.92 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focA</i> <i>focB narG/pCA24N-</i> <i>FhIA</i> | | | 7.7 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focA</i> <i>narG</i> | | | 4.18 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> <i>focA/pCA24N-FhIA</i> | | | 12.8 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> | | | 5.72 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> <i>fdnG</i> | | | 0.13 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> <i>fdnG fdoG</i> | | | 0.2 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> <i>fdoG</i> | | | 0.24 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> <i>narG</i> | | | 6.82 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA focB</i> <i>narG/pCA24N-FhIA</i> | | | 10.6 | 37 | | formate | [65] |

| | | | | | | | | | |
|--------------------|-------------|--|--|--|-------|----|-----|----------|-------|
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> <i>focB/pCA24N-FhIA</i> | | | 13 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA narG</i> | | | 4.84 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA</i> <i>narG/pCA24N-FhIA</i> | | | 12.3 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA/pCA24N</i> | | | 6.38 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycA/pCA24N-</i> <i>FhIA</i> | | | 12.1 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycE</i> | | | 0.07 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycE</i> | | | 0.1 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC</i> <i>hycE/pBS(Kan)</i> | | | 0.02 | 37 | | fructose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC</i> <i>hycE/pBS(Kan)HycE</i> | | | 0.25 | 37 | | fructose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC hycE/pCA24N</i> | | | 0.06 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyaB</i> <i>hybC/pCA24N-FhIA</i> | | | 10.56 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hybC</i> | | | 1.54 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hycE</i> | | | 0.1 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hycE/pBS(Kan)</i> | | | 0.02 | 37 | | fructose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hycE/pBS(Kan)HycE</i> | | | 0.17 | 37 | | fructose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 <i>hyfG</i> | | | 2.53 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113 Δ <i>frdC</i> | | | 0.07 | 37 | 6.3 | glycerol | [271] |
| <i>Escherichia</i> | <i>coli</i> | BW25113/pBS(Kan) | | | 0.49 | 37 | | fructose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113/pCA24N | | | 2.42 | 37 | | glucose | [64] |
| <i>Escherichia</i> | <i>coli</i> | BW25113/pCA24N | | | 0.66 | 37 | | formate | [65] |
| <i>Escherichia</i> | <i>coli</i> | BW25113/pCA24N- | | | 3.12 | 37 | | formate | [65] |

| | | FhIA | | | | | | | |
|--------------------|-------------|---------------------|------|--|------|----|-----|----------------------------------|-------|
| <i>Escherichia</i> | <i>coli</i> | DJT135 | 1.95 | | | 37 | | glucose | [272] |
| <i>Escherichia</i> | <i>coli</i> | epHycE17 | | | 0.46 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE21 | | | 1.01 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE23-2 | | | 0.51 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE39 | | | 0.44 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE67 | | | 0.9 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE70 | | | 0.7 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | epHycE95 | | | 1.1 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | FJT135 | 1.3 | | | 37 | | glucose | [272] |
| <i>Escherichia</i> | <i>coli</i> | HW1 | | | 0.04 | 37 | 6.3 | glycerol | [271] |
| <i>Escherichia</i> | <i>coli</i> | HW2 | | | 0.92 | 37 | 6.3 | glycerol | [271] |
| <i>Escherichia</i> | <i>coli</i> | IFO 12713 | | | 1.28 | 37 | 7 | glucose | [120] |
| <i>Escherichia</i> | <i>coli</i> | J62-1 | | | 5.46 | 28 | | glucose | [273] |
| <i>Escherichia</i> | <i>coli</i> | J62-1 | | | 12.5 | 28 | | formate | [273] |
| <i>Escherichia</i> | <i>coli</i> | J62-1(pNG2) | | | 4.31 | 28 | | glucose | [273] |
| <i>Escherichia</i> | <i>coli</i> | J62-1(pNG2) | | | 11.5 | 28 | | formate | [273] |
| <i>Escherichia</i> | <i>coli</i> | JW135 | 1.25 | | | 37 | | glucose | [272] |
| <i>Escherichia</i> | <i>coli</i> | JW2701-1(pASKA2701) | | | 0.18 | 37 | | glucose/formate | [69] |
| <i>Escherichia</i> | <i>coli</i> | JW2701-1(pVSC1157) | | | 0.64 | 37 | | glucose/formate | [69] |
| <i>Escherichia</i> | <i>coli</i> | JW2701-1(pVSC133) | | | 1.54 | 37 | | glucose/formate | [69] |
| <i>Escherichia</i> | <i>coli</i> | JW2701-1(pVSC14) | | | 0.77 | 37 | | glucose/formate | [69] |
| <i>Escherichia</i> | <i>coli</i> | JW2701-1(pVSC363) | | | 1.1 | 37 | | glucose/formate | [69] |
| <i>Escherichia</i> | <i>coli</i> | LJT135 | 1.6 | | | 37 | | glucose | [272] |
| <i>Escherichia</i> | <i>coli</i> | MC13-4 | 1 | | | 37 | | 1 g/L glucose | [274] |
| <i>Escherichia</i> | <i>coli</i> | MC13-4 | 1.2 | | | 37 | | 18.02 g/L glucose | [274] |
| <i>Escherichia</i> | <i>coli</i> | MC13-4 | 1.25 | | | 37 | | 18.02 g/L glucose 100 mM formate | [274] |

| | | | | | | | | | |
|--------------------|-------------|-------------------|------|------|------|----|-----------|----------------------------------|-------|
| <i>Escherichia</i> | <i>coli</i> | MC13-4 | 1.4 | | | 37 | | 18.02 g/L glucose 1.5 mM formate | [274] |
| <i>Escherichia</i> | <i>coli</i> | MC13-4 | 0.38 | | | 37 | 6.5 | 18.02 g/L glucose 15 mM formate | [275] |
| <i>Escherichia</i> | <i>coli</i> | MC4100 | 0.26 | | | 37 | 6.5 | glucose | [275] |
| <i>Escherichia</i> | <i>coli</i> | shufHycE12T366 | | | 2 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | shufHycE1-9 | | | 1.5 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | shufHycE19T366 | | | 1.8 | 37 | | formate | [66] |
| <i>Escherichia</i> | <i>coli</i> | TG1 | | | 0.26 | 37 | | | [67] |
| <i>Escherichia</i> | <i>coli</i> | TG1 (recombinant) | | | 0.81 | 37 | | | [67] |
| <i>Escherichia</i> | <i>coli</i> | Tikka | | | 0.56 | 37 | 7.10 | glucose | [276] |
| <i>Escherichia</i> | <i>coli</i> | Tikka | | | 3.37 | 37 | 6.38-6.40 | glucose | [276] |
| <i>Escherichia</i> | <i>coli</i> | Tikka | | | 0.22 | 37 | 7.41 | glucose | [276] |
| <i>Escherichia</i> | <i>coli</i> | Tikka | | | 0.28 | 37 | 7.60 | glucose | [276] |
| <i>Escherichia</i> | <i>coli</i> | Tikka | | | 1.23 | 37 | 6.40 | pyruvate | [276] |
| <i>Escherichia</i> | <i>coli</i> | UNF3501 | | | 5.29 | 28 | | glucose | [273] |
| <i>Escherichia</i> | <i>coli</i> | UNF3501 | | | 10.5 | 28 | | formate | [273] |
| <i>Escherichia</i> | <i>coli</i> | UNF3501(pNG2) | | | 6 | 28 | | glucose | [273] |
| <i>Escherichia</i> | <i>coli</i> | UNF3501(pNG2) | | | 11.9 | 28 | | formate | [273] |
| <i>Escherichia</i> | <i>coli</i> | W3110 | 0.54 | 0.58 | | 37 | | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF1 | 0.63 | 0.87 | | 37 | | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF10 | | 0.32 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF11 | | 0.45 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF13 | | 2.58 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF14 | | 0.05 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF15 | | 0.15 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF16 | | 0.16 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF17 | | 0.30 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF2 | 0.70 | 0.71 | | 37 | | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF3 | 0.96 | 0.85 | | 37 | | glucose | [277] |

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|----------------------------|-----------------------|-------------|------|------|--------|----|---------|--------------------------------|-------|
| <i>Escherichia</i> | <i>coli</i> | ZF4 | 0.73 | 0.66 | | 37 | | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF5 | | 0.51 | | 37 | | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF6 | | 0.27 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF7 | | 1.56 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF8 | | 0.28 | | 37 | 7.6 | glucose | [277] |
| <i>Escherichia</i> | <i>coli</i> | ZF9 | | 0.29 | | 37 | 7.6 | glucose | [277] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | | 27.7 | 2.83 | 35 | 6.0 | 10 g/L glucose | [42] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 0.55 | | | 37 | 7.0 | 3 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 0.76 | | | 37 | 7.0 | 18 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.28 | | | 37 | 7.0 | 15 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.36 | | | 37 | 7.0 | 6 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.42 | | | 37 | 7.0 | 9 g/L glucose, 50 mM phosphate | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.53 | | | 37 | 7.0 | 9 g/L glucose, 40 mM phosphate | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.71 | | | 37 | 7.0 | 12 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.72 | | | 37 | 7.0 | 9 g/L glucose, 10 mM phosphate | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.80 | | | 37 | 7.0 | 9 g/L glucose, 30 mM phosphate | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.83 | | | 37 | 7.0 | 9 g/L glucose | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 1.91 | | | 37 | 7.0 | 9 g/L glucose, 20 mM phosphate | [278] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | B49 | 2.20 | | | 35 | 6.0 | 14.5 g/L glucose | [83] |
| <i>Ethanoligenens</i> | <i>harbinense</i> | YUAN-3 | 1.91 | 4.55 | | 35 | 5.0 | glucose | [279] |
| <i>Fervidobacterium</i> | <i>islandicum</i> | DSM 5733 | 1.52 | | | | | glucose | [280] |
| <i>Fusibacter</i> | <i>paucivorans</i> | DSM 12116 | 0.72 | | | 37 | 7.3 | glucose, 20 mM thiosulphate | [281] |
| <i>Fusibacter</i> | <i>paucivorans</i> | DSM 12116 | 3.04 | | | 37 | 7.3 | glucose | [281] |
| <i>Geobacter</i> | <i>sulfurreducens</i> | PCA | | | 0.0008 | 35 | | acetate | [166] |
| <i>Haloanaerobacter</i> | <i>chitinovorans</i> | OGC 229 | | | 1.2 | 37 | 7.0 | glucose | [282] |
| <i>Haloanaerobacter</i> | <i>chitinovorans</i> | W3C1 | | | 1.23 | 37 | 7.0 | glucose | [282] |
| <i>Haloanaerobacterium</i> | <i>kushneri</i> | ATCC 700103 | 0.52 | | | 40 | 6.5-7.5 | glucose | [283] |

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|----------------------------|-------------------------|------------|------|------|------|----|---------|---------------------------------|-------|
| <i>Haloanaerobacterium</i> | <i>kushneri</i> | VS-511 | 0.53 | | | 35 | 7.0 | glucose | [283] |
| <i>Haloanaerobacterium</i> | <i>kushneri</i> | VS-732 | 0.48 | | | 35 | 6.5 | glucose | [283] |
| <i>Haloanaerobium</i> | <i>saccharolyticum</i> | DSM 6643 | 0.62 | | | 37 | 7.4 | glycerol | [284] |
| <i>Haloanaerobium</i> | <i>saccharolyticum</i> | DSM 6643 | 2.44 | | | 37 | 7 | glucose | [284] |
| <i>Haloanaerobium</i> | <i>saccharolyticum</i> | DSM 7779 | 1.61 | | | 37 | 7 | glycerol | [284] |
| <i>Haloanaerobium</i> | <i>saccharolyticum</i> | DSM 7779 | 2.17 | | | 37 | 7 | glucose | [284] |
| <i>Haloanerobium</i> | <i>alcaliphilum</i> | DSM 8275 | 0.09 | | | 37 | 6.7-7.0 | pyruvate | [285] |
| <i>Haloanerobium</i> | <i>alcaliphilum</i> | DSM 8275 | 0.26 | | | 37 | 6.7-7.0 | glucose | [285] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | 0.12 | 6.76 | 2.7 | 38 | 7.0 | 200 mM glucose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | 0.22 | 7.65 | 3.06 | 38 | 7.0 | 150 mM glucose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | 0.36 | 8.96 | 3.58 | 38 | 7.0 | 100 mM glucose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | 1.0 | 9.62 | 3.90 | 38 | 7.0 | 50 mM glucose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | 1.5 | 8 | | 38 | 7.0 | sucrose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | | 2.6 | | 38 | 7.0 | maltose | [286] |
| <i>Klebsiella</i> | <i>oxytoca</i> | HP1 | | 2 | | 38 | 7.0 | starch | [286] |
| <i>Klebsiella</i> | <i>pneumoniae</i> | | 14.8 | | | 37 | 6.9-7.0 | citrate, 36 μ M Ni | [287] |
| <i>Klebsiella</i> | <i>pneumoniae</i> | | 9.5 | | | 37 | 6.9-7.0 | citrate | [287] |
| <i>Klebsiella</i> | sp. | HE1 | 0.2 | | 0.45 | 37 | 7.5 | xylose (static incubation) | [219] |
| <i>Klebsiella</i> | sp. | HE1 | 0.2 | | 0.45 | 37 | 7.5 | sucrose (static incubation) | [219] |
| <i>Klebsiella</i> | sp. | HE1 | 0.33 | | 0.34 | 37 | 7.5 | xylose (incubation by shaking) | [219] |
| <i>Klebsiella</i> | sp. | HE1 | 0.5 | | 0.67 | 37 | 7.5 | sucrose (incubation by shaking) | [219] |
| <i>Peptostreptococcus</i> | <i>asaccharolyticus</i> | ATCC 14963 | 0.2 | | | 37 | 7.5 | glutamate | [207] |
| <i>Propionispora</i> | <i>vibrioides</i> | DSM 13305 | 0.86 | | | 37 | 7.5 | mannitol | [288] |
| <i>Propionispora</i> | <i>vibrioides</i> | DSM 13305 | 0.86 | | | 37 | 7.5 | fructose | [288] |
| <i>Propionispora</i> | <i>vibrioides</i> | DSM 13305 | 0.87 | | | 37 | 7.5 | xylitol | [288] |
| <i>Propionispora</i> | <i>vibrioides</i> | DSM 13305 | 1 | | | 37 | 7.5 | erythritol | [288] |
| <i>Pyrococcus</i> | <i>furius</i> | DSM 3638 | | | 2 | 98 | 7.0- | yeast extract, tryptone | [39] |

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|---------------------|---------------|-----------|-----------|--|-------|----|-----|--|-----------|
| | | | | | | | 7.2 | | |
| <i>Pyrococcus</i> | <i>furius</i> | DSM3638 | | | 3.25 | 85 | 6.5 | keratin hydrolysate | [78] |
| <i>Ruminococcus</i> | <i>albus</i> | 7 | 0.79 | | | 37 | 7 | glucose | [289] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.4 | 37 | | cellulose | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.53 | 37 | | cellulose, 40 mg palladium/charcoal in medium | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.09 | 37 | | cellulose, 100 mg palladium/charcoal in medium | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.42 | 37 | | cellulose | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.28 | 37 | | cellulose, 20 mg palladium above medium | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | D-7 | | | 0.009 | 37 | | cellulose, 50 mg palladium above medium | [290] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.11 | | | 37 | | 15 g/L glucose | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.12 | | | 37 | | 10 g/L glucose | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.14 | | | 37 | | 20 g/L glucose | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.52 | | | 37 | | 3 g/L glucose | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.59 | | | 37 | | sorghum residues | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.61 | | | 37 | | sorghum extract | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 3.15 | | | 37 | | sorghum stalks | [291] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 1.44 | | | 37 | | arabinose | [292] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.07 | | | 37 | | xylose | [292] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.10 | | | 37 | | arabinose | [292] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.09-2.76 | | | 37 | | 5 g/L glucose | [291-293] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 5.59 | | | 37 | | cellobiose | [292] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 1.72 | | | 37 | | paperboard | [293] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.18 | | | 37 | | paper tissue | [293] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.27 | | | 37 | | office paper | [293] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.29 | | | 37 | | magazine paper | [293] |
| <i>Ruminococcus</i> | <i>albus</i> | DSM 20455 | 2.89 | | | 37 | | newspaper | [293] |

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|---------------------------|---------------------|------------|-------|--|--------|-------|---------|------------------------|-------|
| <i>Ruminococcus</i> | <i>albus</i> | | 2.57 | | | | | glucose | [183] |
| <i>Ruminococcus</i> | <i>flavefaciens</i> | C94 | 0.37 | | | 37 | | cellulose | [294] |
| <i>Ruminococcus</i> | <i>flavefaciens</i> | | 0.33 | | | 37 | | cellulose | [183] |
| <i>Ruminococcus</i> | sp. | 18P13 | 0.422 | | | 37 | | cellulose | [266] |
| <i>Salmonella</i> | <i>enterica</i> | Gärtner | 1 | | 0.3 | | | formate | [4] |
| <i>Selenomonas</i> | <i>ruminantium</i> | GA31 | | | 0.0003 | 37 | | glucose | [182] |
| <i>Selenomonas</i> | <i>ruminantium</i> | HD1 | | | 0.0003 | 37 | | glucose | [182] |
| <i>Selenomonas</i> | <i>ruminantium</i> | HD4 | 2.04 | | | 37 | 7.0 | glucose | [295] |
| <i>Selenomonas</i> | <i>ruminantium</i> | HD4 | | | 0.002 | 37 | | glucose | [182] |
| <i>Selenomonas</i> | <i>ruminantium</i> | PC18 | | | 0.002 | 37 | | glucose | [182] |
| <i>Spirochaeta</i> | <i>aurantia</i> | J3 | 1.025 | | | 30 | 7.5 | glucose | [184] |
| <i>Spirochaeta</i> | <i>aurantia</i> | J4L | 1.043 | | | 30 | 7.5 | glucose | [184] |
| <i>Spirochaeta</i> | <i>aurantia</i> | J4T | 1.23 | | | 30 | 7.5 | glucose | [184] |
| <i>Spirochaeta</i> | <i>aurantia</i> | M1 | 0.968 | | | 30 | 7.5 | glucose | [184] |
| <i>Spirochaeta</i> | <i>aurantia</i> | Vinzent | 1.104 | | | 30 | 7.5 | glucose | [184] |
| <i>Spirochaeta</i> | <i>thermophila</i> | DSM 6192 | 2.949 | | | 64-66 | 6.95 | glucose | [296] |
| <i>Sporacetigenium</i> | <i>mesophilum</i> | DSM 16796 | 1.4 | | | 39 | 8.8 | glucose | [297] |
| <i>Staphylothermus</i> | <i>marinus</i> | DSM 3639 | | | 0.026 | 85 | 6.5 | yeast extract, peptone | [298] |
| <i>Thermicanus</i> | <i>aegypticus</i> | DSM 12793 | 0.26 | | | 55-60 | 6.5-7.0 | cellobiose | [299] |
| <i>Thermicanus</i> | <i>aegypticus</i> | DSM 12793 | 2.8 | | | 55-60 | 6.5-7.0 | glucose | [299] |
| <i>Thermoanaerobacter</i> | <i>brockii</i> | DSM 1457 | 0.53 | | | 65 | 7.5 | lactose | [251] |
| <i>Thermoanaerobacter</i> | <i>ethanolicus</i> | ATCC 31550 | 0.1 | | | 72 | 7.5 | glucose | [300] |
| <i>Thermoanaerobacter</i> | <i>ethanolicus</i> | DSM 2246 | 0.27 | | | 65 | 5.8-8.5 | lactose | [251] |
| <i>Thermoanaerobacter</i> | <i>ethanolicus</i> | DSM 2355 | 0.24 | | | 65 | 5.8-8.5 | lactose | [251] |
| <i>Thermoanaerobacter</i> | <i>finnii</i> | DSM 3389 | 0.59 | | | 65 | 6.5-6.8 | lactose | [251] |
| <i>Thermoanaerobacter</i> | <i>finnii</i> | DSM 3389 | 0.01 | | | 60 | 7.0 | glucose, thiosulphate | [301] |
| <i>Thermoanaerobacter</i> | <i>finnii</i> | DSM 3389 | 0.03 | | | 60 | 7.0 | xylose, thiosulphate | [301] |

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|------------------------------|------------------------------|-----------|------|------|-------|-------|---------|-----------------------------|-------|
| <i>Thermoanaerobacter</i> | <i>finnii</i> | DSM 3389 | 0.12 | | | 60 | 7.0 | glucose | [301] |
| <i>Thermoanaerobacter</i> | <i>finnii</i> | DSM 3389 | 0.14 | | | 60 | 7.0 | xylose | [301] |
| <i>Thermoanaerobacter</i> | <i>mathranii</i> | DSM 11426 | 0.9 | | | 70-75 | 6.8-7.8 | xylose | [302] |
| <i>Thermoanaerobacter</i> | sp. | DSM 9801 | 0.01 | | | 60 | 7.0 | glucose, thiosulphate | [301] |
| <i>Thermoanaerobacter</i> | sp. | DSM 9801 | 0.02 | | | 60 | 7.0 | xylose, thiosulphate | [301] |
| <i>Thermoanaerobacter</i> | sp. | DSM 9801 | 0.09 | | | 60 | 7.0 | glucose | [301] |
| <i>Thermoanaerobacter</i> | sp. | DSM 9801 | 0.10 | | | 60 | 7.0 | xylose | [301] |
| <i>Thermoanaerobacter</i> | <i>tengcongensis</i> | JCM 11007 | 0.3 | | | 75 | 7.5 | glucose | [303] |
| <i>Thermoanaerobacter</i> | <i>thermoanhydrolyticus</i> | DSM 2247 | 0.34 | | | 65 | 6.9-7.5 | lactose | [251] |
| <i>Thermoanaerobacter</i> | <i>thermoanhydrolyticus</i> | DSM 567 | 3.67 | | | 65 | 6.9-7.5 | lactose | [251] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | DSM 571 | 7.44 | | | 60 | 7-8.5 | lactose | [251] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 0.73 | | | | | glucose, NH ₄ Cl | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 1.3 | | | | | starch, NH ₄ Cl | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 1.75 | | | | | sucrose, NH ₄ Cl | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 2.43 | | | | | glucose, peptone | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 2.8 | | | | | starch, peptone | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 4.18 | | 12.12 | 60 | 6.5 | 20 g/L sucrose | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 4.91 | | 5.73 | | 6.25 | 10 g/L sucrose | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 5.06 | | | | | 10 g/L sucrose, peptone | [304] |
| <i>Thermoanaerobacterium</i> | <i>thermosaccharolyticum</i> | PSU-2 | 5.45 | | | 60 | 6.5 | 5 g/L sucrose | [304] |
| <i>Thermoanaerobium</i> | <i>brockii</i> | HTD4 | 0.04 | | | 65 | | pyruvate | [192] |
| <i>Thermoanaerobium</i> | <i>brockii</i> | HTD4 | 0.05 | | | 65 | | glucose, 600 μmol acetone | [192] |
| <i>Thermoanaerobium</i> | <i>brockii</i> | HTD4 | 0.09 | | | 65 | | glucose 200 μmol acetone | [192] |
| <i>Thermoanaerobium</i> | <i>brockii</i> | HTD4 | 0.3 | | | 65 | | glucose | [192] |
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.19 | 8.84 | 10.7 | 60 | 7.0 | xylose | [305] |
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.23 | 9.03 | 11.2 | 60 | 7.0 | glucose/xylose (20/80) | [305] |
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.32 | 9.62 | 12.5 | 60 | 7.0 | glucose/xylose (50/50) | [305] |
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.37 | 9.7 | 12.7 | 60 | 7.0 | glucose/xylose (80/20) | [305] |

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|---------------------------|------------------------------|-----------|------|------|------|-------|-----|---|-------|
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.42 | 9.7 | 12.2 | 60 | 7.0 | glucose | [305] |
| <i>Thermoanaerobium</i> | <i>thermosaccharolyticum</i> | W16 | 2.4 | | 12.7 | 60 | 7.0 | corn stover hydrolysate | [305] |
| <i>Thermoanaerovibrio</i> | <i>velox</i> | DSM 12556 | 0.7 | | | 60-65 | 7.3 | glucose | [306] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 1.64 | | | 67 | 8.2 | 25 mM glucose, yeast extract 50 mM phosphate | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 1.78 | | | 67 | 8.2 | 25 mM glucose, yeast extract | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.04 | | | 67 | 8.2 | 25 mM glucose, yeast extract 25 mM phosphate | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.49 | | | 67 | 8.2 | 50 mM glucose, 1 mM FeSO ₄ | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.60 | | | 67 | 8.2 | 50 mM glucose, 10 mM FeSO ₄ | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.67 | | | 67 | 8.2 | 25 mM glucose, yeast extract 12.5 mM phosphate | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.83 | | | 67 | 8.2 | 50 mM glucose, 25 mM FeSO ₄ | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.87 | | | 67 | 8.2 | 50 mM glucose, 50 mM FeSO ₄ | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 2.93 | | | 67 | 8.2 | 50 mM glucose, 100 mM FeSO ₄ | [194] |
| <i>Thermobrachium</i> | <i>celere</i> | DSM 8682 | 3.08 | | | 67 | 8.2 | 50 mM glucose, 200 mM FeSO ₄ | [194] |
| <i>Thermococcus</i> | <i>litoralis</i> | DSM 5473 | | | 3.25 | 85 | 6.5 | keratin hydrolysate | [78] |
| <i>Thermococcus</i> | <i>litoralis</i> | DSM 5473 | | | 4.70 | 85 | 6.5 | 5% (w/v) peptone | [78] |
| <i>Thermococcus</i> | <i>litoralis</i> | DSM 5473 | | | 6.75 | 85 | 6.5 | 10% (w/v) peptone | [78] |
| <i>Thermosipho</i> | <i>africanus</i> | DSM 3509 | 2.33 | | | | | glucose | [280] |
| <i>Thermotoga</i> | <i>elfii</i> | | 2.8 | | | | | glucose | [280] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 3.4 | 0.24 | 1.45 | 80 | | xylose | [307] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 3.8 | 0.21 | 1.24 | 80 | | glucose | [307] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 3.8 | 0.24 | 0.97 | 80 | | arabinose | [307] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 0.3 | | | 80 | | 12 mM glucose, elemental sulphur (headspace to liquid ratio 11.5:1) | [308] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 0.5 | | | 80 | | 12 mM glucose, elemental sulphur (headspace to liquid ratio 2:1) | [308] |

| | | | | | | | | | |
|--|--|-----------|------|------|------|----|---------|--|-------|
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 2 | | | 80 | | 15 mM glucose (headspace to liquid ratio 2:1) | [308] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 4 | | | 80 | | 12 mM glucose (headspace to liquid ratio 11.5:1) | [308] |
| <i>Thermotoga</i> | <i>maritima</i> | DSM 3109 | 1.67 | | 8.2 | 80 | 6.5-7.0 | 7.5% (w/v) glucose | [198] |
| <i>Thermotoga</i> | <i>naphthophila</i> | DSM13996 | 3.96 | | | 80 | 7.0 | glucose | [309] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 1.84 | | 8.7 | 75 | 6.5-7.0 | 7.5% (w/v) glucose | [198] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 2.04 | | 0.05 | 60 | 7.5 | 14 mM glucose | [310] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.09 | | 0.27 | 65 | 7.5 | 14 mM glucose | [310] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.18 | | 0.47 | 70 | 7.5 | 14 mM glucose | [310] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.75 | | 0.8 | 85 | 7.5 | 14 mM glucose | [310] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 4.11 | | | 77 | 7.5 | 14 mM glucose | [310] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 2.7 | 1.67 | 0.42 | 80 | | xylose | [307] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.2 | 4.17 | 0.61 | 80 | | glucose | [307] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.2 | 2.08 | 0.59 | 80 | | arabinose | [307] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.8 | | | 80 | | glucose, malonic acid | [311] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 1.41 | | | 77 | 7.5 | xylose | [312] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 1.82 | | | 77 | 7.5 | glucose | [312] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 2.20 | | | 77 | 7.5 | xylose (nitrogen sparging) | [312] |
| <i>Thermotoga</i> | <i>neapolitana</i> | DSM 4359 | 3.24 | | | 77 | 7.5 | glucose (nitrogen sparging) | [312] |
| <i>Thermotoga</i> | <i>neapolitana</i> | | 2.26 | | | | | glucose | [280] |
| <i>Thermotoga</i> | <i>neapolitana</i> | | | | 0.29 | 70 | 8.5 | starch | [313] |
| <i>Thermotoga</i> | <i>neapolitana</i> | | | | 0.19 | 70 | 8.5 | glucose | [313] |
| <i>Thermotoga</i> | <i>petrophila</i> | DSM13995 | 3.74 | | | 80 | 7.0 | glucose | [309] |
| <i>Thermotoga</i> | sp. | SEBR 2665 | 2.76 | | | | | glucose | [280] |
| <i>Thermotoga</i> | sp. | SEBR 7054 | 3.38 | | | | | glucose | [280] |
| <i>Victivallis</i> | <i>vadensis</i> | DSM 14823 | 1.46 | | | 37 | 6.5 | glucose | [314] |
| <i>Clostridium</i> <i>Bacillus</i> | <i>butyricum</i> <i>thermoamylovorans</i> | M1 I | | | 0.2 | 40 | | brewery yeast waste | [227] |
| <i>Clostridium</i> <i>Clostridium</i> | sp. <i>butyricum</i> | R1 | 2.6 | | | 30 | 6.0 | cellobiose | [230] |

| | | | | | | | | | |
|--|---|-------------|-----|--|--|----|--|----------------------------|-------|
| <i>Clostridium</i> <i>Thermoanaerobacterium</i> | <i>thermocellum</i> <i>thermosaccharolyticum</i> | JN4 GD17 | 1.8 | | | 60 | | microcrystalline cellulose | [142] |
|--|---|-------------|-----|--|--|----|--|----------------------------|-------|

⁺ for reference please refer to manuscript