

SEQUENCE LISTING

<110> DSM IP Assets B.V.

<120> Improved production of riboflavin

<130> 26251

<160> 92

<170> PatentIn version 3.3

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ggcggtagta aagcacatth gcttttagagc ccgtgacccg tgtgcataag cacgcggtgg	180
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 tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg 120
 caggggtggaa atcccgaccg gcggtagtaa agcacatttg ctttagagcc cgtgacccgt 180
 gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg 240
 agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc 300
 gtaaaatacc taaagccccg aattttttat aaattcgggg ctttttt 347

<210> 57
 <211> 347
 <212> DNA
 <213> Bacillus subtilis

<400> 57
 tttgtttttc tcaaattgta agttttatttc taattttaaat tttatttgac aaaaatgggc 60
 tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgga tccttcgggg 120
 caaatggaa atcccgaccg gcggtagtaa agcacatttg ctttagagcc cgtgacccgt 180

gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc	300
gtaaaatacc taaagccccg aattttttat aaattcgggg ctttttt	347

<210> 58
 <211> 347
 <212> DNA
 <213> Bacillus subtilis

<400> 58	
tttgtttttc tcaaattgta agtttatttc taatttaa	60
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg	120
cagggtggaa atccccgaccg gcggtagtaa agcacatttg ctttagagtc cgtgaccctg	180
gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc	300
gtaaaatacc taaagccccg aattttttat aaattcgggg ctttttt	347

<210> 59
 <211> 349
 <212> DNA
 <213> Bacillus subtilis

<400> 59	
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc	60
cctacagggt gtgtaataat ttaattataa ggacaaatga ataaagattg tatccttcgg	120
ggcagggtgg aaatccccgac cggcggtagt aaagcacatt tgctttagag cccgtgaccc	180
gtgtgcataa gcacgcggtg gattcaattt aagctgaagc cgacagtgaa agtctggatg	240
ggagaaggat gatgagccgc tatgcaaaat gtttaaaaat gcatagtgtt atttcctatt	300
gcgtaaaata cctaaagccc cgaatttttt ataaattcgg ggctttttt	349

<210> 60
 <211> 328
 <212> DNA
 <213> Bacillus subtilis

<400> 60	
tttgtttttc tcaaattgta agtttatttc taatttaa	60
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg	120
cagggtggaa atccccgaccg gcggtagtaa agcacatttg ctttagagcc cgtgaccctg	180

gtgcataagc acgcggtgga ttcaatttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc	300
gtaaaatacc taaagccccg aatTTTTT	328

<210> 61
 <211> 324
 <212> DNA
 <213> Bacillus subtilis

<400> 61	
tttgtttttc tcaaattgta agtttatttc taaaaatttt aaaaaagggt attgactttc	60
cctacagggt gtgtaataat ttaattataa ggacaaatga ataaagattg tacccttcgg	120
ggcagggtgg aaatccccgac cggcggtagt aaagcacatt tgcttttagag cccgtgaccc	180
gtgtgcataa gcacgcggtg gattcagttt aagctgaagc cgacagtga agtctggatg	240
ggagaaggat gatgagccgc tatgcaaaat gtttaaaaat gcatagtgtt atttcctatt	300
gcgtaaaata cctaaagccc cgaa	324

<210> 62
 <211> 322
 <212> DNA
 <213> Bacillus subtilis

<400> 62	
tttgtttttc tcaaattgta agtttatttc taattttaat tttatttgac aaaaatgggc	60
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg	120
cagggtggaa atccccgaccg gcggtagtaa agcacatttg ctttagagcc cgtgacccgt	180
gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc	300
gtaaaatacc taaagccccg aa	322

<210> 63
 <211> 316
 <212> DNA
 <213> Bacillus subtilis

<400> 63	
tttgtttttc tcaaattgta agtttatttc taaaaatttt aaaaaagggt attgactttc	60
cctacagggt gtgtaataat ttaattataa ggacaaatga ataaagattg tacccttcgg	120
ggcagggtgg aaatccccgac cggcggtagt aaagcacatt tgcttttagag cccgtgaccc	180

gtgtgcataa gcacgcggtg gattcagttt aagctgaagc cgacagtgaa agtctggatg	240
ggagaaggat gatgagccgc tatgcaaaat gtttaaaaat gcatagtgtt atttcctatt	300
gcgtaaaata cctaaa	316

<210> 64
 <211> 314
 <212> DNA
 <213> Bacillus subtilis

<400> 64	
tttgtttttc tcaaattgta agtttatttc taattttaa	60
tttatttgac aaaaatgggc	
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg	120
cagggtggaa atcccgaccg gcggtagtaa agcacatttg ctttagagcc cgtgaccctg	180
gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatga tgagccgcta tgcaaaatgt ttaaaaatgc atagtgttat ttcctattgc	300
gtaaaatacc taaa	314

<210> 65
 <211> 251
 <212> DNA
 <213> Bacillus subtilis

<400> 65	
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc	60
cctacagggt gtgtaataat ttaattataa ggacaaatga ataaagattg tatccttcgg	120
ggcagggtgg aaatcccgac cggcggtagt aaagcacatt tgctttagag cccgtgaccc	180
gtgtgcataa gcacgcggtg gattcagttt aagctgaagc cgacagtgaa agtctggatg	240
ggagaaggat g	251

<210> 66
 <211> 86
 <212> DNA
 <213> Bacillus subtilis

<400> 66	
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc	60
cctacagggt gtgtaataat ttaatt	86

<210> 67
 <211> 225
 <212> DNA

<213> Bacillus subtilis

<400> 67
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc 60
cctacagggg gtgtaataat ttaattataa ggacaaatga ataaagattg gatccttcgg 120
ggcaaaatgg aaatcccgac cggcggtagt aaagcacatt tgcttttagag cccgtgaccc 180
gtgtgtataa gcacgcggtg gattcagttt aagctgaagc catgg 225

<210> 68
<211> 223
<212> DNA
<213> Bacillus subtilis

<400> 68
tttgtttttc tcaaattgta agtttatttc taattttaat tttatttgac aaaaatgggc 60
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgga tccttcgggg 120
caaaatggaa atcccgaccg gcggtagtaa agcacatttg cttagagcc cgtgaccctg 180
gtgtataagc acgcggtgga ttcagtttaa gctgaagcca tgg 223

<210> 69
<211> 316
<212> DNA
<213> Bacillus subtilis

<400> 69
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc 60
cctacagggg gtgtaataat ttaattataa ggacaaatga ataaagattg tacccttcgg 120
ggcaggggtg aaatcccgac cggcggtagt aaagcacatt tgcttttagag tccgtgaccc 180
gtgtgcataa gcacgcggtg gattcagttt aagctgaagc cgacagtga agtctggatg 240
ggagaaggat gatgagccgc tatgcaaaat gtttaaaaat gcatagtgtt atttcctatt 300
gcgtaaaata cctaaa 316

<210> 70
<211> 251
<212> DNA
<213> Bacillus subtilis

<400> 70
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaaggt attgactttc 60
cctacagggg gtgtaataat ttaattataa ggacaaatga ataaagattg tacccttcgg 120
ggcaggggtg aaatcccgac cggcggtagt aaagcacatt tgcttttagag tccgtgaccc 180

gtgtgcataa gcacgcggtg gattcagttt aagctgaagc cgacagtgaag agtctggatg	240
ggagaaggat g	251

<210> 71
 <211> 249
 <212> DNA
 <213> Bacillus subtilis

<400> 71	
tttgtttttc tcaaattgta agtttatttc taatttaaat tttatttgac aaaaatgggc	60
tcgtgttgta caataaatgt agtgataagg acaaatgaat aaagattgta tccttcgggg	120
caggggtggaa atcccgaccg gcggtagtaa agcacatttg ctttagagtc cgtgaccctg	180
gtgcataagc acgcggtgga ttcagtttaa gctgaagccg acagtgaaag tctggatggg	240
agaaggatg	249

<210> 72
 <211> 186
 <212> DNA
 <213> Bacillus subtilis

<400> 72	
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaagggt attgactttc	60
cctacaggggt gtgtaataat ttaattataa ggacaaatga ataaagattg cagaatagtc	120
ttttaagtaa gtctactctg aattttttta gacggtaaat aacaaaagag gggagggaaa	180
caaatg	186

<210> 73
 <211> 203
 <212> DNA
 <213> Bacillus subtilis

<400> 73	
tttgtttttc tcaaattgta agtttatttc taaaaatttt acaaaaagggt attgactttc	60
cctacaggggt gtgtaataat ttaattataa ggacaaatga ataaagattg attttatcga	120
agggcagcac ctgtccttct ccttacactt tgagggaggt gaacacagac ggtaaataac	180
aaaagagggg agggaaacaa atg	203

<210> 74
 <211> 263
 <212> DNA
 <213> Bacillus subtilis

<400> 74
 ataaggacaa atgaataaaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg 60
 tagtaaagca catttgcttt agagcccggtg acccggtgtgc ataagcacgc ggtggattca 120
 atttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca 180
 aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa gccccgaatt 240
 ttttataaat tcggggccttt ttt 263

<210> 75
 <211> 263
 <212> DNA
 <213> Bacillus subtilis

<400> 75
 ataaggacaa atgaataaaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg 60
 tagtaaagca catttgcttt agagtccgtg acccggtgtgc ataagcacgc ggtggattca 120
 gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca 180
 aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa gccccgaatt 240
 ttttataaat tcggggccttt ttt 263

<210> 76
 <211> 263
 <212> DNA
 <213> Bacillus subtilis

<400> 76
 ataaggacaa atgaataaaag attgtatcct tcggggcaaa atggaaatcc cgaccggcgg 60
 tagtaaagca catttgcttt agagcccggtg acccggtgtgc ataagcacgc ggtggattca 120
 gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca 180
 aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa gccccgaatt 240
 ttttataaat tcggggccttt ttt 263

<210> 77
 <211> 263
 <212> DNA
 <213> Bacillus subtilis

<400> 77
 ataaggacaa atgaataaaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg 60
 tagtaaagca catttgcttt agagcccggtg acccggtgtgc ataagcacgc ggtggattca 120

gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca	180
aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa gccccgaatt	240
ttttataaat tcggggcttt ttt	263

<210> 78
 <211> 230
 <212> DNA
 <213> Bacillus subtilis

<400> 78	
ataaggacaa atgaataaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg	60
tagtaaagca catttgcttt agagcccgctg acccggtgtgc ataagcacgc ggtggattca	120
gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca	180
aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa	230

<210> 79
 <211> 255
 <212> DNA
 <213> Bacillus subtilis

<400> 79	
ataaggacaa atgaataaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg	60
tagtaaagca catttgcttt agagcccgctg acccggtgtgc ataagcacgc ggtggattca	120
gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca	180
aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa gccccgaatt	240
ttttataaat ttttt	255

<210> 80
 <211> 255
 <212> DNA
 <213> Bacillus subtilis

<400> 80	
ataaggacaa atgaataaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg	60
tagtaaagca catttgcttt agagcccgctg acccggtgtgc ataagcacgc ggtggattca	120
gtttaagctg aagccgacag tgaaagtctg gatgggagaa ggatgatgag ccgctatgca	180
aaatgtttaa aaatgcatag tgttatttcc tattgcgtaa aatacctaaa tttttataa	240
attcggggct ttttt	255

<210> 81

<211> 165
<212> DNA
<213> Bacillus subtilis

<400> 81
ataaggacaa atgaataaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg 60
tagtaaagca catttgcttt agagcccgctg acccggtgtgc ataagcacgc ggtggattca 120
gtttaagctg aagccgacag tgaaagtcct gatgggagaa ggatg 165

<210> 82
<211> 135
<212> DNA
<213> Bacillus subtilis

<400> 82
ataaggacaa atgaataaag attgtatcct tcggggcagg gtggaaatcc cgaccggcgg 60
tagtaaagca catttgcttt agagcccgctg acccggtgtgc ataagcacgc ggtggattca 120
gtttaagctg aagcc 135

<210> 83
<211> 26
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 83
gtagtaaagc acatttgctt tagagc 26

<210> 84
<211> 36
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 84
caaatgtgct ttactactgc cggtcgggat ttccac 36

<210> 85
<211> 21
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 85
gcggtagtaa agcacatttg c 21

<210> 86
<211> 40
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 86
caaatgtgct ttactaccgc tggtcgggat ttccaccctg 40

<210> 87
<211> 26
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 87
tagtaaagca catttgcttt agagcc 26

<210> 88
<211> 45
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 88
gctctaaagc aaatgtgctt tactatcgcc ggtcgggatt tccac 45

<210> 89
<211> 21
<212> DNA
<213> Artificial

<220>
<223> primer

<400> 89
gtgaccctg tgcataagca c 21

<210> 90
<211> 45
<212> DNA
<213> Artificial

<220>		
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<400>	90	
	tgcttatgca cacgggtcac aggctctaaa gcaaatgtgc ttac	45
<210>	91	
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<212>	DNA	
<213>	Artificial	
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<400>	91	
	tgaagccgac agtgaaagtc tg	22
<210>	92	
<211>	41	
<212>	DNA	
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<220>		
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<400>	92	
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