

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH- FOOD RESEARCH

INSTITUTE (CSIR-FRI), ACCRA, GHANA



REPORT ON POWER CONSUMPTION BY LABORATORIES IN

CSIR-FOOD RESEARCH INSTITUTE

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INTRODUCTION

The power consumption by equipment and or electrical gadgets in the various laboratories under the various divisions within the CSIR-Food Research Institute is presented in tables. Each table consists of the name of equipment or electrical gadgets in the laboratory, the quantity of equipment or electrical gadget available and the amount of power consumed in kilowatts per item.

1.0 FOOD GENERAL CHEMISTRY LABORATORY

o.	Item	Quantity	Kilowatts (kW)/Item
1	Freezer	1	0.40
2	Hot box oven	2	1.60
3	Thermconcept	1	6.00
4	Vecstor furnace	1	4.60
5	Panasonic mixer grinder	1	0.36
6	Fridge	1	0.20
7	Air condition	3	5.592
8	Fluorescent light	24	1.392
9	Ceiling fan	6	0.45
10	Water heater	1	1.50
11	Analytical balance	1	0.015
12	Fume chamber	2	0.34
13	Kjeltec sampler (8420)	1	2.20
14	Foss scrubler (2501)	1	2.30
<u>Total</u>			<u>26.949</u>

2.0 FOOD CHEMISTRY RESEARCH LABORATORY – I

No.	Item	Quantity	Kilowatt (kW)/Item
1	Printer	3	0.15
2	Agilent technologies 7890B GC system	1	2.956
3	Edwards	1	0.45
4	Water heater	1	1.50
5	Air condition	2	3.728
6	Fluorescent light	16	0.928
7	Ceiling fans	4	0.30
8	Waterbath	1	1.50
9	HS 501 digital	1	0.07
10	Fume chamber	1	0.17
11	Freezer	1	0.40
12	Desktop PC	2	0.96
13	Spectrometer	1	0.17
14	Polartronic	1	0.96
15	Kjeltec sampler (2200)	2	2.20
<u>Total</u>			<u>15.742</u>

3.0 FOOD CHEMISTRY RESEARCH LABORATORY – II

No.	Item	Quantity	Kilowatt (kW)/Item
1	Fluorescent light	16	0.928
2	Air condition	2	3.729
3	Desktop PC	2	0.26
4	Gerhardt Soxtherm	1	1.20
5	Buck Scientific (AAS)	1	0.15
6	Fume chamber	1	0.17
7	Printer	1	0.05
8	Riello UPS (Multisystem)	1	9.00
9	Agilent technologies (GTA 120) Graphite Atomizer	1	3.50
10	Van Deer Heyen (Cooling system)	1	1.70
11	Compressor	1	1.119
12	Waterbath	1	1.50
13	Hotplate	5	3.50
<u>Total</u>			<u>26.806</u>

4.0 MYCOTOXIN LABORATORY

No.	Item	Quantity	Kilowatt (kW)/Item
1	Fluorescent light	20	1.6
2	Fume chamber	1	0.17
3	Ceiling fans	4	0.30
4	Elix Progard Purification System	1	1.50
5	Water heater	1	1.50
6	Knife mill	1	3.00
7	Vortex machine	1	0.03
8	Sonicator	1	1.20
9	Waterbath	1	1.50
10	Centrifuge	2	0.215
11	Hot plate	1	0.70
12	Air condition	3	5.592
13	AT – 1260 Infinity ELSD	1	0.414
14	Desktop PC	6	0.78
15	Printer	3	0.15
16	Amino Acid Analyzer (LC300)	1	0.414
17	Binary (HPLC pump) 1352	1	0.15
18	Fridge	1	0.20
19	Freezer	1	0.40
20	Hot oven	2	1.60
21	Analytical balance	1	0.015
<u>Total</u>			<u>20.99</u>

6.0 FISHERIES LABORATORY

No.	Item	Quantity	Kilowatt (kW)/Item
1	Air condition	8	16.80
2	Fluorescent lights	28	1.624
3	Microwave	1	0.80
4	Analytical balance	1	0.054
5	Water pump	15	0.225
6	Dispenser	1	0.62
7	Freezer	1	0.396
8	Fridge	2	0.60
<u>Total</u>			<u>21.119</u>

7.0 MUSHROOM LABORATORY

No.	Item	Quantity	Kilowatt (kW)/Item
1	Air condition	5	9.45
2	Moment Incubator	1	1.00
3	Fluorescent light	12	0.696
4	Hot oven	2	6.80
5	Salvis	1	1.20
6	Flow chamber	1	1.31
7	Climate fridge	2	0.72
8	Microwave	1	0.80
9	Autoclave	2	3.20
Total			54.176

8.0 FOOD PROCESSING LABORATORY- I

No.	Item	Quantity	Kilowatt (kW)/Item
1	Spectrometer	1	3.45
2	Analytical balance	1	0.015
3	pH meter	1	0.034
4	Juicer	1	0.55
5	Platform scale	1	0.0045
6	Memment Climate Chamber	1	1.30
7	Rice mill	1	0.40
8	Rice polisher	1	0.30
9	Desktop PC	1	0.13
10	Centrifuge	1	0.12
11	Brenberder	1	6.00
12	Viscograph	1	4.80
13	Mill	1	1.80
14	Electric stove	1	2.50
15	Hot oven	2	1.6
16	Energy light	6	0.03
17	Grinder	1	0.36
18	Air condition	1	2.60
<u>Total</u>			<u>25.99</u>

9.0 FOOD PROCESSING LABORATORY - II

No.	Item	Quantity	Kilowatt (kW)/Item
1	Blender	1	0.60
2	Fistren Cycl**	1	6.00
3	Analytical balance	1	0.015
4	Moisture meter	1	0.65
5	Blast freezer	1	1.30
6	Freezer	1	0.108
7	Spectrometer	1	0.18
8	Air condition	1	2.16
9	Vacuum sealer	1	0.4
10	Colloid mill	1	1.10
11	Stirrer	1	0.075
12	Electric burner	1	2.332
13	Air compressor	1	0.55
14	Spray dryer	1	0.368
15	Electric shaker	1	0.184
16	Water bath	1	1.20
17	Deep freezer	1	1.028
18	Energy saving lights	6	0.51
<u>Total</u>			<u>18.86</u>

10.0 SORGHUM LABORATORY

No.	Item	Quantity	Kilowatt (kW)/Item
1	Colour meter	1	0.001
2	Water bath	1	0.345
3	pH meter	2	0.012
4	Hot oven 1	1	2.332
5	Hot oven 2	1	0.80
6	Hot oven 3	1	1.50
7	Eurostar digital	1	0.075
8	Freezer	1	0.108
9	Centrifuge	1	0.1
10	Air condition	1	1.839
11	Spectrometer	1	0.18
12	Ceiling fans	2	0.15
13	Fluorescent light	6	0.348
14	Fridge	1	0.40
<u>Total</u>			<u>8.199</u>

11.0 BREWING PLANT

No.	Item	Quantity	Kilowatt (kW)/Item
1	Electric dryer	1	19.10
2	Pasteurizer	2	6.84
3	Air condition	1	6.15
4	Chilling vessel	2	6.75
5	Oil heater	4	27.36
6	Motor	4	6.00
7	Air compressor (1)	1	9.00
8	Air compressor (2)	1	1.8
9	Hammer mill	1	1.103
10	Kettle motor	2	3.50
11	Hot-water tank	1	6.84
12	Electric pump	2	2.60
<u>Total</u>			<u>97.045</u>

12.0 INCUBATION SESSION

No.	Item	Quantity	Kilowatt (kW)/Item
1	Transformers	2	6.00
2	Sealing machine	1	1.38
3	Fluorescent light	25	1.485
4	Electric boiler	2	5.10
5	Air condition	1	3.50
6	Ceiling fans	3	0.90
7	Printer	1	0.05
8	Platform scale	1	0.0045
9	Standing fan	1	0.21
10	Extraction fan	2	0.732
<u>Total</u>			<u>19.28</u>

13.0 PROCESSING HALL

No.	Item	Quantity	Kilowatt (kW)/Item
1	Fluorescent light	80	4.64
2	Air condition	5	11.65
3	Fridge	1	3.00
4	Electric dryer 1 (R. Royce)	1	69.00
5	Electric dryer 2 (FRI)	1	37.103
6	Electric dryer 2 (Apex)	1	8.303
7	Tunnel dryer	1	60.00
8	Sealing machine	3	0.45
9	Analytical balance	1	0.054
10	Hammer mill with sifter	1	36.00
11	Roaster 1	1	1.50
12	Roaster 2	1	1.103
13	Drum dryer	1	3.30
14	Stem boiler	1	50.00
15	Y-cyclone	1	0.736
16	Dispenser	1	0.62
Total			287.559

14.0 MOLECULAR LABORATORY (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Freezer	2	0.80
2	Fluorescent light	26	1.51
3	Air condition	2	5.02
4	Oven	1	0.93
5	Microscopes	3	0.06
6	Stabilizer	1	0.39
7	Colony counter	2	0.02
Total			8.73

15.0 PATHOGEN LABORATORY (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Centrifuge	1	0.44
2	Bioanalyser	1	0.06
3	Desktop PC	2	0.96
4	Air condition	1	2.51
5	Fridge	2	0.40
6	Fluorescent light	8	0.46
7	Battery boxes	2	4.80
8	Clifton Incubator	1	0.80
9	Safety chamber	1	1.31
10	Agilent Technologies Stratagene Mx3005p	1	1.20
Total			12.94

16.0 MAIN LABORATORY (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Clifton Incubator	3	2.40
2	Clifton Incubator (s)	1	0.25
3	Air condition	1	2.51
4	Desktop PC	1	0.48
5	Oven	2	4.80
6	Fluorescent light	24	1.39
7	Safety chamber	1	1.31
8	Water bath	2	3.00
Total			11.34

17.0 WASHING AND DECONTAMINATION (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Refrigerator	1	0.22
2	Air condition	1	2.51
3	Autoclave	2	32.00
4	Fluorescent lights	8	0.46
5	Oven	1	2.50
6	Microwave	1	1.45
Total			36.64

18.0 STERILIZATION AND WASHING ROOM (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Washing machine	1	5.85
2	Distilling plant	1	3.00
3	Oven	1	3.00
4	Fluorescent light	2	0.12
Total			11.97

19.0. SAMPLING ROOM (MICROBIOLOGY)

No.	Item	Quantity	Kilowatt (kW)/Item
1	Stomacher	1	0.14
2	Refrigerator	1	0.14
3	Air condition	1	1.30
4	Fluorescent light	4	0.23
Total			1.81

20.0 KITCHEN AND SENSORY LABORATORY

No.	Laboratory/Processing Session	Quantity	Power Consumed (kW)/Item
1	Fluorescent light	36	2.088
2	Refrigerator	1	3.00
3	Ceiling Fan	10	0.75
4	Electric Burner	2	4.664
5	Microwave	1	1.45
6	Sealing Machine	1	0.15
7	Rice Cooker	1	0.78
8	Deep Freezer	1	1.028
9	Cake Mixer	1	1.00
10	Pasta Maker	1	0.18
11	Water Heater	2	3.00
12	Grinding Machine	1	0.946
13	Boiler	1	13.86
Total			32.90

21.0 SUMMARY

The following table below is a summary list of laboratories and processing sessions at CSIR-Food Research Institute and the estimated power consumed by equipment and electrical gadgets in the laboratories.

No.	LABORATORY/PROCESSING SESSION	NUMBERS OF ITEMS	POWER CONSUMED (kW)
1	General Chemistry Laboratory	46	26.95
2	Chemistry Research Laboratory I	38	15.74
3	Chemistry Research Laboratory II	34	26.81
4	Mycotoxins	52	20.99
5	Fisheries	57	21.12
6	Mushroom	28	54.18
7	Processing Laboratory I	24	25.99
8	Processing Laboratory II	23	18.86
9	Sorghum Laboratory	21	8.20
10	Brewing Plant	22	97.05
11	Incubation Session	41	19.81
12	Processing Hall	101	287.56
13	Microbiology Laboratory	117	83.45
14	Kitchen and Sensory Laboratory	50	32.90