Supplementary Materials:

Supplemental Table 1. Overview of time and temperature during the production of the rye snack: mixing, extrusion, drying, cooling, packaging.

| Process part-name | Dough mixing | Extrusion | Transport band | Drying oven | Cooling spiral | Transport band | Package machine |
|-------------------|--------------|-----------|----------------|-------------|----------------|----------------|-----------------|
| Time              | 10 min       | 1. part   | 2. part        | 3. part     | 1 min          | 13 min         | 20 min          | 5 min           | 5 min           |
| Temperature       | 25 C         | 20 sec    | 5 sec          | 5 sec       | 45°C           | 55°C           | 140°C           | 60°C            | 90-100°C        | 40°C            | 30°C            | 30°C            |
|                   | 30 sek       |           |                |             |                |                |                 |                 |                 |                 |                 |                 |

44 minutes
Supplemental Table 2. List of raw materials, mix of flour, and extruded rye snacks utilized to study the antioxidative action of different flavourings and different amounts of seaweed extracts.

| Group                      | Components               | Seaweed, amount (%) |
|----------------------------|--------------------------|---------------------|
| Raw materials             | Rye mix                  | 0                   |
| Raw materials             | Seaweed                  | 0                   |
| Raw materials             | Garlic powder (1%)       | 0                   |
| Raw materials             | Basil powder (0.5%)      | 0                   |
| Raw materials             | Tomato powder (3 %)      | 0                   |
| Raw materials             | Rosemary powder (0.5%)   | 0                   |
| Mix of flour              | 1% garlic                | 0                   |
| Mix of flour              | 1% garlic                | 2                   |
| Mix of flour              | 1% garlic                | 3                   |
| Mix of flour              | 1% garlic                | 4                   |
| Mix of flour              | 1% garlic                | 5                   |
| Mix of flour              | 0.5% basil + 3% tomato   | 0                   |
| Mix of flour              | 0.5% basil + 3% tomato   | 2                   |
| Mix of flour              | 0.5% basil + 3% tomato   | 3                   |
| Mix of flour              | 0.5% basil + 3% tomato   | 4                   |
| Mix of flour              | 0.5% basil + 3% tomato   | 5                   |
| Mix of flour              | 0.5% rosemary            | 0                   |
| Mix of flour              | 0.5% rosemary            | 2                   |
| Mix of flour              | 0.5% rosemary            | 3                   |
| Mix of flour              | 0.5% rosemary            | 4                   |
| Mix of flour              | 0.5% rosemary            | 5                   |
| Extruded samples          | 1% garlic                | 0                   |
| Extruded samples          | 1% garlic                | 2                   |
| Extruded samples          | 1% garlic                | 3                   |
| Extruded samples          | 1% garlic                | 4                   |
| Extruded samples          | 1% garlic                | 5                   |
| Extruded samples          | 0.5% basil + 3% tomato   | 0                   |
| Extruded samples          | 0.5% basil + 3% tomato   | 2                   |
| Extruded samples          | 0.5% basil + 3% tomato   | 3                   |
| Extruded samples          | 0.5% basil + 3% tomato   | 4                   |
| Extruded samples          | 0.5% basil + 3% tomato   | 5                   |
| Extruded samples          | 0.5% rosemary            | 0                   |
| Extruded samples          | 0.5% rosemary            | 2                   |
| Extruded samples          | 0.5% rosemary            | 3                   |
| Extruded samples          | 0.5% rosemary            | 4                   |
| Extruded samples          | 0.5% rosemary            | 5                   |
Supplemental Table 3. List of snack prototypes produced to study the effect of different flavourings and roasting on antioxidant properties of rye snacks enriched with *Fucus vesiculosus* extracts.

| Description | Roasting |
|-------------|----------|
| Rye-Mix+ 0.8% Himalayan salt | Unroasted |
| Rye-Mix+ 0.8% Himalayan salt | Roasted |
| Rye-Mix+2.1% seaweed + 0.8% Himalayan salt | Unroasted |
| Rye-Mix+2.1% seaweed + 0.8% Himalayan salt | Roasted |
| Rye-Mix+2.1% seaweed + 1% garlic+ 0.8% Himalayan salt | Unroasted |
| Rye-Mix+2.1% seaweed + 1% garlic+ 0.8% Himalayan salt | Roasted |
| Rye-Mix+2.1% seaweed + 0.5% basil+3% tomato powder+ 0.8% Himalayan salt | Unroasted |
| Rye-Mix+2.1% seaweed + 0.5% basil+3% tomato powder+ 0.8% Himalayan salt | Roasted |
| Rye-Mix+2.1% seaweed + 0.5% rosemary+ 0.8% Himalayan salt | Unroasted |
| Rye-Mix+2.1% seaweed + 0.5% rosemary+ 0.8% Himalayan salt | Roasted |