

# CONTENTS

<b>Contents</b>	.....	<b>I</b>
<b>Abbreviations</b>	.....	<b>IV</b>
<b>Chapter 1</b>	<b>GENERAL INTRODUCTION.....</b>	<b>1</b>
	Introduction.....	2
	Growth and maturation.....	5
	Fat-free body mass partitioning.....	9
	FFM Hydration.....	11
	Body composition assessment in children and youth.....	14
	The young athlete.....	51
	Body composition assessment in young athletes.....	58
	References.....	70
<b>Chapter 2</b>	<b>METHODOLOGY.....</b>	<b>104</b>
	Sample.....	105
	Measures.....	107
	Statistical analysis.....	115
	References.....	117
<b>Chapter 3</b>	<b>TOTAL BODY WATER MEASUREMENTS IN ADOLESCENT ATHLETES: A COMPARISON OF SIX FIELD METHODS WITH DEUTERIUM DILUTION.....</b>	<b>119</b>
	Abstract.....	119
	Introduction.....	120
	Methods.....	122
	Results.....	134
	Discussion.....	144
	Practical applications.....	149
	References.....	150
<b>Chapter 4</b>	<b>ANTHROPOMETRIC MODELS TO PREDICT APPENDICULAR LEAN SOFT TISSUE IN ADOLESCENT ATHLETES.....</b>	<b>155</b>
	Abstract.....	155
	Introduction.....	156
	Subjects and methods.....	159

	Results.....	165
	Discussion.....	173
	Study limitations.....	177
	Conclusions.....	177
	References.....	179
<b>Chapter 5</b>	<b>WEEKLY TRAINING HOURS ARE ASSOCIATED WITH MOLECULAR AND CELLULAR BODY COMPOSITION LEVELS IN ADOLESCENT ATHLETES.....</b>	<b>183</b>
	Abstract.....	183
	Introduction.....	184
	Methods.....	185
	Results.....	190
	Discussion.....	199
	References.....	203
<b>Chapter 6</b>	<b>MOLECULAR AND CELLULAR BODY COMPOSITION PROFILES OF YOUNG MALE ATHLETES ACTIVE IN FOUR DIFFERENT SPORTS.....</b>	<b>209</b>
	Abstract.....	209
	Introduction.....	210
	Methods.....	211
	Results.....	215
	Discussion.....	224
	Conclusion.....	229
	References.....	230
<b>Chapter 7</b>	<b>SKELETAL BONE MASS IN ADOLESCENT MALE ATHLETES AND NON-ATHLETES: POSITIVE EFFECTS OF HIGH-IMPACT SPORTS.....</b>	<b>235</b>
	Abstract.....	235
	Introduction.....	236
	Methods.....	237
	Results.....	240
	Discussion.....	249
	Conclusion.....	252
	References.....	254
<b>Chapter 7</b>	<b>DISCUSSION.....</b>	<b>258</b>

Body composition methodology.....	262
Body composition alterations.....	267
Summary.....	273
References.....	283
<b>Chapter 8 CONCLUSION.....</b>	<b>288</b>
<b>Acknowledgments</b> .....	<b>293</b>
<b>About the author</b> .....	<b>294</b>
<b>Publications</b> .....	<b>295</b>

## **ABBREVIATIONS**

**BF** – Body fat mass

**FFM** – Fat-free mass

**BW** – Body weight

**BV** – Body volume

**D<sub>b</sub>** – Body density

**ADP** – Air-displacement plethysmography

**DXA** – Dual energy X-ray absorptiometry

**BIA** – bioelectrical impedance analysis

**SKF** – skinfold thickness

**UW** – underwater weighing

**ECF** – Extracellular fluids

**ECS** – Extracellular solids

**ECW** – Extracellular water

**ICW** – Intracellular water

**E/I** – Extracellular to intracellular water ratio

**TBW** – Total body water

**BMC** – Bone mineral content

**BMD** – Bone mineral density

**BA** – Bone area

**Mo** – bone mineral

**Ms** – Soft tissue mineral

**BCM** – Body cell mass

**2C** – Two-component molecular model

**3C** – Three-component molecular model

**4C** – Four-component molecular model

**MultiC** – Multi-component molecular model